



Computer Weekly

Thursday, September 22, 1983

HP gets into the personal fray

by Philip Hunter
HEWLETT-Packard this week launched a 16-bit IBM compatible micro and a worldwide marketing campaign to attack the business personal computer market.

The move strengthens the company's armoury in the battle for small business system users, following the launch in July of three minis to replace the HP 3000 Series.

The new HP150 has a touch sensitive screen, and offers the MS-DOS operating system, but not the popular CP/M system. UK retail price will be £2,900 for a version with dual 3½-in Sony floppy disc drives, and £4,650 for a 15 Mbyte hard disc version, making it comparable with other popular models, notably the IBM PC and the Sirius.

John Golding, head of European marketing of personal computers, claims that the pricing of the new machine ends the company's reputation for offering quality only at great expense.

"We are aiming for 10% to 15% of the business PC market," says Golding. This market will be worth about \$10 billion in 1984, according to some estimates.

The company will start a big promotional push at UK dealers, software houses and users in 1984, and has already embarked on a \$7 million television advertising campaign in the US.



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level operating system called Personal Application Manager to shield the user from the complexities of MS-DOS. "It is possible for the user not to realise that MS-DOS is the operating system," Golding claims.

The HP150 has a 9in screen, but Golding claims that the sharp definition of the display will compensate for its size.

European versions of the HP150 will be built at Grenoble in France, and Golding says that each country will have its own version of the machine.

The company has its own high

There's gold in those dead computers

by John Kavanagh
"LABOURERS wanted for computer scrapyard," ran the advertisement in London *Afternoon Star* magazine. A quick telephone call revealed that the labourers had to have at least four O-levels.

"A lot of old mainframes are being thrown out now," said Dennis Savish, manager of labourer-seeker Walmar Processing. "There's a second-user market for some of the peripherals but no one wants a 10-year-old IBM processor."

"We strip the computers down for precious metals," Savish said. "There's gold and silver in the connection and circuit boards."

"But you have to know where to look and be able to get it out without getting a lot of rubbish in with it. And you have to be careful, because manufacturers keep finding alternatives to precious metals. That's why we need labourers with a bit of intelligence."

Peripherals were of little value to Walmar, Savish said. They were mainly mechanical and had fewer circuit boards.

He said the computer scrap business had grown up over the last four years and there were now a dozen companies knocking on users' doors. Walmar, one of the biggest, goes all over the UK and to the continent looking at dead processors.

GEC converges on commercial market

by John Kavanagh
GEC is setting its sights on the commercial computing market in a big way for the first time.

The UK industrial giant's move follows the signing of a deal with US microcomputer manufacturer Convergent Technologies and a decision to standardise on the Unix operating system following tests.

But the move is still 18 months off and will depend partly on the company's success with the Convergent Technologies' 16-bit machine.

The US microcomputer fills a gap at the bottom of GEC's 4000 microcomputer range. It runs Unix and GEC is now completing live tests of Unix on the 4000 at some customer sites.

GEC Information Systems will sell the microcomputer directly to users through its own sales force and through its office automation subsidiary A.B. Dick.

The new 16-bit machine will be sold in the UK, Europe and the US.

Links to GEC's SL-1 digital private telephone exchange and to the telex super telex service will be provided.

If GEC's plans come to fruition this will be the company's most positive push into the commercial market.

"Our existing scientific and engineering users are asking for equipment such as the Convergent Technologies machine, because they want to move towards applications to stand-alone micros," explained Chris Ellis, the marketing director of GEC Information Systems.

"First we will satisfy the needs of these, our traditional, customers."

"Some will add the micros to their GEC networks."

"But our ambitions don't stop there. We're not really big in commercial computing — but that will change."

"We'll start by aiming at programmers, who will be attracted to the GEC networks."



BT rejects IBM billing and gives ICL a chance

by John Kavanagh

BRITISH Telecom has rejected a US package, based on IBM hardware, which could have been a quick answer to its need for a new customer billing system.

The corporation has gone back to the drawing board to develop its own system, giving ICL a chance to win a plum contract, which could involve orders from the 61 telephone areas.

BT had been evaluating the system from US telephone firm Cincinnati Bell since March. "We feel that taking an established system would be a quick way to get going," BT said. "But the US company's working practices and the way it is managed are very different from ours and we would have to put a lot of time and effort into adapting it."

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European versions of the HP150 will be built at Grenoble in France, and Golding says that each country will have its own version of the machine.

The company has its own high

bill. It will also hold dealers' customer's communication, with fault histories, changes and so on. The Ericsson package would have held this second part of the system.

BT had a new billing system partly because the 61 areas are being given more autonomy and becoming profit centres, so its central billing system is no longer appropriate. In addition it is a batch system and more than 15 years old. It produces bills but little in the way of management reports. It runs on ICL mainframes.

BT wants a new billing system because of the possibility of competition as its monopoly is watered down.

The new billing system will give customers the option of having details of every call printed on the bill.

Given the technology that is available we can develop our own system fairly quickly. A tailor-made system is bound to be better."

BT said it was now at the

system development stage but had not decided which area to use. ICL was a possibility.

options would be considered.

probably ICL's biggest.

Meanwhile BT is not

systems from IBM, GEC or

say, before choosing the

team that will handle the

of the billing sys-

tem.

The billing project has

from various quan-

ts. The National Com-

Civil Liberties has pointed

possibility of government

monitoring calls.

excess of £100,000, plus substantial share options. Laidlaw's salary, according to the most recently published accounts, is £74,000. Managing director Robb Wilmot gets £152,000.

Reactions to the news of Edwardes' appointment were favourable, and Mercury put on a brave face over his departure.

"He's been very good for us," said a Mercury spokesman. "You could always do with a man like that for a bit longer. A great deal

of work has been done

on the contract.

Edwardes' appointment

is to replace retiring ICL chairman Sir Christopher Laidlaw. Edwardes is currently non-executive chairman of Mercury Communications and is to quit the post when his contract expires at the end of the year.

BT man Laidlaw has decided to retire after three years in office and will leave ICL next April. Edwardes joined the ICL board as a non-executive director last Saturday and is scheduled to become deputy chairman on January 1, taking over from Laidlaw on April 2. His contract is for three years and is renewable.

Laidlaw may have been over cautious, and Edwardes is likely to be more adventurous.

"Some board members won't be able to stand the pace," continued Barion, "and within 12 months one or two may find him overwhelming."

Edwardes will receive a salary in

excess of £100,000, plus substantial share options. Laidlaw's salary, according to the most recently published accounts, is £74,000. Managing director Robb Wilmot gets £152,000.

City analysts were generally pleased with the announcement.

"It's bad news that Laidlaw's going," said Neil Barton of Cooke Lumsden. "He's well able to run a company, but the Edwardes appointment is good news — he's proved himself and has attractive features which will help ICL."

"Laidlaw may have been over cautious, and Edwardes is likely to be more adventurous."

Rodime wins big US contract

by Caroline Burgess
PUBLICLY-BACKED Rodime has won a \$7 million contract to supply Winchester discs to US micro maker North Star.

The Scottish-based company is to supply 5½ inch discs to North Star's factories on both sides of the Atlantic — in California and in Cork — over the next 15 months.

Rodime now gets 60% of its orders from the US. Its California sales office was set up at the beginning of last year.

The company is building a

manufacturing plant in Florida which should start production by the end of next year.

Malcolm Dudson, Rodime's managing director, described the deal as significant, saying: "As a growing number of US micro manufacturers come to set up European production facilities, Rodime's capacity to service them on both sides of the Atlantic will become increasingly important".

The high capacity RO 206 and RO 208 drives to be supplied are to be manufactured in Scotland.

Circulation rises

COMPUTER WEEKLY has boosted its circulation to 120,000 copies, making it the highest circulation weekly computer journal in the UK. The move is part of continuing developments at Computer Weekly, which recognises the increased size of the industry it is serving. Last week, for example, saw the introduction of Management Review, a monthly supplement to Computer Weekly.

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West's software lead may crumble

by John Riley

THE Western world's lead in software engineering will fall apart unless universities shake up their computing courses and make them relevant to the real world.

That view was forcibly put to the IFIP '83 computer conference in Paris last week by Ian Sommerville of the University of Strathclyde Computer Science Department.

"Software engineering is the most urgent technological challenge which we face," he said.

"Computing is not a science — it is based on hypothesis and test — but is concerned with creating artefacts and therefore has more in common with engineering."

His description of software engineering teaching at Strathclyde was an eye-opener to European and American academics at IFIP '83. Strathclyde has done away with lectures, ignores teaching programmes and orientates the whole course round one large software system.

"Programming is easy," he said, "but in software engineering the problem is in designing and how to solve problems. Students are immature — they think that 100,000 lines of code is just a scaled up 100 lines of Basic and don't understand the value of design."

Sommerville drums the importance of style and design into his students by giving them real world situations. "In the real world users change their minds with contradictory requirements; money is important; quality of documentation is important; and computer work involves taking and maintaining bad programs. That teaches them the importance of style."

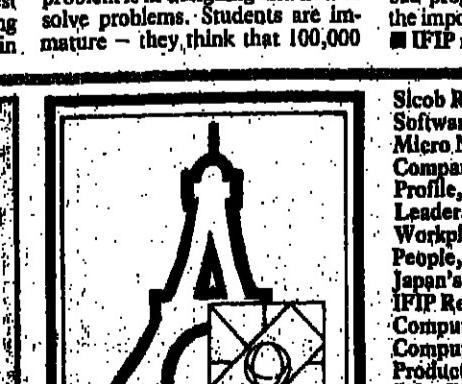
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Thomson to surrender its computer interests to CGE in big shake-up

France shares out its electronics companies

by Jack Gee
THE French government has given its blessing to a division of power in the country's electronic industries between Thomson-Burdet and Compagnie Générale d'Électricité which will create a series of State-owned monopolies in key products.

CGE acquires a dominating role in the telecommunications industry through the creation of a new firm which regroups the activities of its subsidiary CIT-Alcatel in this sector with those of Thomson. Although the newcomer is to be called Thomson Telecommunications it is scheduled to come under CGE's total control within three years.

Thomson will surrender its computer interests to CGE which has been told by the government to work in close concert with Bull, the national computer manufacturer.

Bull chairman, Jacques Stern,

has declined to comment on the nature of his new ties with CGE.

Besides ending Thomson's ambitions in office automation, CGE also acquires control of its rival's nationalised in February 1982 with France's other big industrial groups, confirms that even under State ownership the law of survival of the fittest still applies.

It is not yet clear how the new organisation will affect negotiations between CGE and Italy's Olivetti to develop and produce electronic typewriters, setting the foundations for a French office automation industry.

The government's aim is to make both firms better able to compete in world markets and to emerge as more attractive partners for foreign groups.

Last year Thomson, headed by militant Socialist Alain Gomez, lost £183 million, mostly from telecommunications. Its staff of 129,000, of whom 30,000 work in telecoms manufacture, now face severe pruning, although the government says that no dismissals must follow the rationalisation of Thomson and CGE holding companies.

Olivetti chief executive Carlo de Benedetti wants to buy back two-thirds of the French stake and sell it to AT&T in the framework of a joint office equipment venture.

Acquisition of CGE's small role in computer components and semiconductors could be a poisoned chalice for Thomson which is already encountering the cyclical problems inherent in this section. CGE will retain control over its own

liquid crystal flat screen development.

The exchange of assets between the two companies, which were nationalised in February 1982 with France's other big industrial groups, confirms that even under State ownership the law of survival of the fittest still applies.

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yield massive results, said Muller.

Insight reported that the Japanese national programme was moving ahead under strong technical direction by the Institute for New Generation Computer Technology.

This is the main recommendation to the EEC Esprit and UK Alvey programmes by SPL's Insight Fifth Generation Group. Members of the group presented their findings to heads of the two programmes after a fact-finding tour of Japan and the US.

Insight director Bob Muller said he viewed the need for a central research unit as the most important discovery of the tour.

Our efforts should feed off the results of Japanese and US work, as they have done off ours, argues the Insight team.

A central research unit could

port by the US, UK, USSR or other computer manufacturing countries.

Brazil has recently pulled out

and in the last week France signalled its intention to do so.

"We want to involve as many countries as possible in the programme," said Abdul-Hadi Kaddoura, Unesco's deputy director-general for science. "The programme will be run on a global basis, for example, our Environment and Marine Science programmes."

The new Integrated Programme on Informatics proposed by M'Bow is expected to gain Unesco general conference's approval next month in Paris and will involve all nations.

M'Bow considers computer technology a "social event" affecting the whole planet" and that "solidarity between nations is needed" as it develops. He warned of the dangers of "breaking the world into computer and non-computer areas," which the new pro-

gramme seeks to avoid by providing training, computer education and public information in computers and IT.

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Viewdata network for Rumbelows

by Donald Kennett

THORN-BMI's retailing subsidiary Rumbelows plans to have a network of 500 viewdata terminals in its stores by next summer to support stock location and re-ordering and sales reporting.

On the systems software front UCC is looking for programmer productivity aids such as development tools, plus products for installations using IBM's DOS operating system. At present UCC concentrates on big MVS sites. These new products could come from takeovers of European systems or suppliers, Cocks said.

Cocks managing director

Dougal Craig-Wood said the system illustrated how the growth of private viewdata was being boosted by customising the application and the terminals to the user's needs.

"There is a market for standard terminals and off-the-shelf systems," he said. "But it is a mistake to force those on to users." Bishopsgate came into existence in 1980 to supply terminals for the Stock Exchange's Topic system, now the world's biggest private viewdata system with 2,000 terminals and a growth rate of 30% a

year. The requirements for the terminals included transmission of 9,600 bits per second and the ability to be connected to any of different kinds of data links.

The company's customer work has since been extended to include software supporting a page carousel display, a fast buffer, up to 12 forms for data collection, an error-correction transmission protocol, in addition to locally-held data and various identifiers.

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MSC doubles its training hand-out

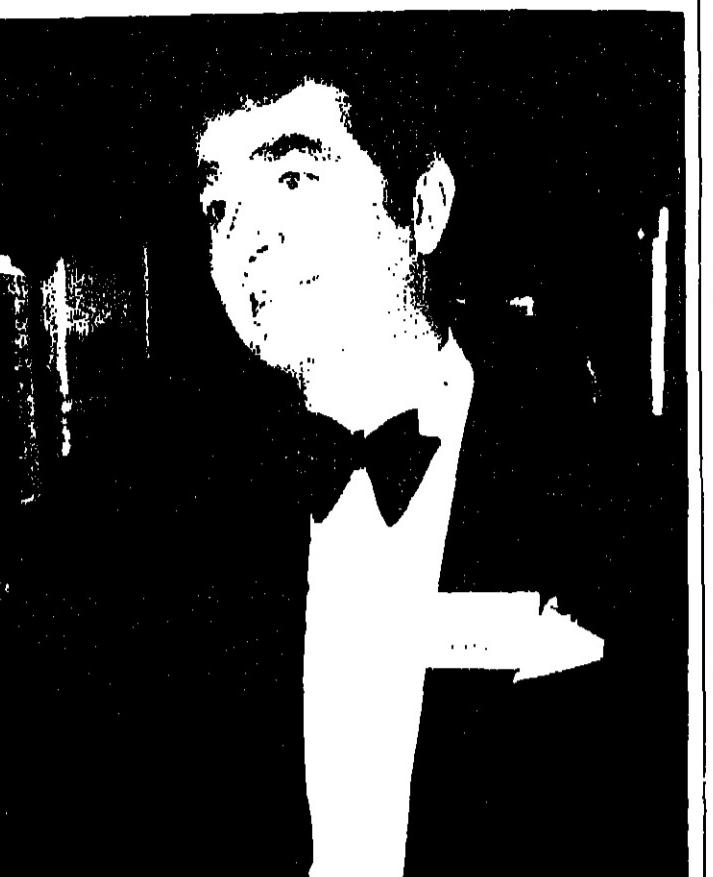
by Philip Hunter

THE Manpower Services Commission (MSC) has more than doubled its cash support for firms in the computing services industry so they can train their staff.

The total grant aid available in the next 12 months is £600,000, but there is now a limit of £750 per trainee, and no one firm can have more than 30 grants.

"We have managed to get training based on what people need," says Gordon Ewan, head of Cosit, the Computing Services Industry Training Council, which will distribute the grants. Ewan welcomes the increased total cash available, but says he originally wanted £1,000 not £750 for each trainee.

Companies will now have to conform more closely to training guidelines laid down by Cosit and is really worth the money.



EWAN... "Got to show willing and join the club."

Shortfall in IBM software and support, says report

by Keith Holder

IBM NETWORK products are something of a curate's egg according to users' comments expressed in a Xuron report, *Networking in Practice*. The overall message is that while the hardware is robust and reliable, the software and support leaves something to be desired.

A real expertise shortage is ascribed to IBM's support function, view shared by John Barker, computer systems manager for Aylesford Systems & Computer Equipment, who commented: "The biggest problem with support is when you try to upgrade your software. IBM changes what

High street battle hots up

by Keith Holder

THE high street battle to sell software to the home computer user has been joined by National Magazine and HMV. Both companies have announced plans and products, aimed at Britain's one million users, offering games and educational packages.

The company is keeping quiet about future releases, though Roger Barrett, publishing director of Elbury, said: "Some of these will be linked to topics covered in our major publications."

These are aimed at the three to six year old and will run on most popular machines including the BBC Micro B, Sinclair Spectrum, Dragon and Commodore 64. The cost for each cassette is £12.95.

They will be available through specialist computer stores, high street department stores and direct from the publishers. Each package has been produced in conjunction with a team of educational experts and programmers.

The company is keeping quiet about future releases, though Roger Barrett, publishing director of Elbury, said: "Some of these will be linked to topics covered in our major publications."

He sees a good market for this type of product, adding: "There are more microcomputers, per capita, in this country than anywhere else in the world and we believe

SALES BRIEFS

Barclays orders 600 more minis

DIGITAL Equipment has an order for 600 PDP-II minis, about £5 million from Barclays Bank, following an earlier order for 100 PDP-IIIs. All the minis will be installed in the bank's base to form the base of a data system offering electronic banking.

The minis will run the controller software developed by the bank to link branch terminals with the private Barclays operations network.

Bank buys Arbut

ARBAT, the UK specialist banking systems, has won £170,000 export order. Holst fifth largest bank, Crédit Lyonnais, Bank Nederland, will be using an Arbut computer host terminal (CFT) to link up to roughly mainframe and the public telex network.

The MSC hints that more money might be available next year. Rob Napier of the MSC's training group says: "We're saying to Cosit that we're sufficiently impressed by what you've produced so far to go ahead. But we reserve the right to pull out."

Napier says that the MSC's other programmes of support for the computer industry will be virtually unchanged in 1984. One such programme is for firms to send staff on courses in implementation of small business systems, limited to five grants per company.

Another loophole was that some training firms claimed last year that their clients could make a profit from training with the MSC grants. "We will make damn sure that it doesn't happen again," says Ewan. With a single block grant this time, Cosit will find it easier to make sure that the training is really worth the money.

Bureaux lose to insiders

by John Kavanagh

COMPUTING services firms are more than holding their own in the recession, with surviving companies growing at an average of 20% a year — and predicting a rosy future.

But the bureau business is under heavy threat and failing rapidly as a percentage of the total market as more and more companies move to in-house computing.

This emerges from the Computing Services Association's (CSA) annual report, which shows that 15% of its 192 members grew 50% last year. Another 40% grew by over one fifth. Total revenues were about £815 million and the members employed over 29,500 people.

But the recession claimed some victims, and if these companies' results are taken into account the overall growth rate was about 15%.

The healthy state of services companies and their need for cash to fund growth make them prime targets for takeovers, the report indicates. Hardly any firms with between 100 and 200 staff have stayed independent. But the report notes that this could change because more firms are going for Stock Exchange listings to raise funds.

Bureau processing is still the biggest market segment, but last year it fell from 34% to 30%. Only one-third of the members thought it would grow in 1983. Software services is the second biggest money spinner, with 17% of the market, while consultancy and turnkey systems services have

about 14% each. Software products now accounts for 8% of the business.

Hardware accounts for a "surprisingly high" 15% of CSA members' revenues. Bureaux are boosting income by selling microcomputers and terminals, while software houses are getting more involved in providing complete systems.

Retiring president Peter



THOMAS... "Growing government and City confidence."

Pactel said there were firm signs of growing government and City confidence in the industry. The government had announced a further £15 million for the Software Products Scheme and the Manpower Services Commission had made more money available for training. There had been more City investment in services projects than ever before.

Hazeltine offshoot bid to raise takeover cash

by Nuala Moran

ESPRIT Systems of New York, which became independent of the Hazeltine Corporation in February, is offering 1,100,000 shares to the public on the New York exchange. They are being offered at between \$12 and \$15 each, so the sale could raise up to \$16.5 million.

Part of this will be spent on financing acquisitions in computer peripherals and small business computer systems that will be manufactured offshore and sold through the company's worldwide network of 75 dealers.

All research and development work is done at our headquarters in New York," said Maurer, "but by transferring our manufacturing off-shore costs have been cut right back. At the same time, an independent company we don't face the same overheads we did as part of Hazeltine."

These adjustments in expenditure mean that Esprit can keep its prices down and appeal to the low end, non-programmable market which is estimated as growing at 20% a year worldwide.

Esprit sold about 24,000 terminals in the first six months of its independence. This compares with 34,000 which Hazeltine sold in 1982, an increase of about 40%.

Allan Maurer, Esprit vice-president

Apple scraps Lisa software deal

by Howard Karten

APPLE Computer has cancelled an arrangement under which Cullinet was developing software to permit interfacing the Lisa with mainframes. The move follows price cuts for the Lisa.

Introduced in January costing \$10,000, the Lisa was seen from the start as an impressive product. But industry observers had several questions about its viability, such as the lack of a software base, the lack of upward compatibility of previously-written Apple software, Lisa's high price, and the inroads into the business world already made by IBM.

Apple's price reductions — a Lisa will now cost \$6,995 with no software, \$8,190 with six software packages originally introduced with it — are generally regarded in the US as at least tacit admission that sales have been lagging.

Apple is reported to have spent about \$50 million on development costs.

In addition, the original price tag is seen as having put off smaller firms which otherwise were attracted to the idea of microcomputers for their businesses.

Cancellation of the Cullinet pact will not help sales. Software for linking IBM Personal Computers to mainframes (chiefly those with IBM's Escutcheon) has been a hot area in America in recent months, with most major mainframe software vendors announcing such a package.

Lisa has lagged conspicuously behind in this area, and prospective buyers in larger corporations are said to have been disappointed.

CTL in the City

COMPUTER Technology Ltd, which heads the UK sales of Tandem in the market for hardware, continues to sell hardware and software solutions to the financial sector. Its latest contract worth £1 million, is for the supply of a third Argus computer system for installation at an Adnec oilfield in Abu Dhabi to aid oil production equipment.

Unit System III is the most up-to-date version of the operating system and contains all the promised facilities such as source code management.

Philips says the Plexus supermicros were also favoured because they implement Unix efficiently, enabling up to 40 users to run on a single P60 supermicro.

Philips had planned to launch its office automation system at Hanover Fair last spring. But the company had not been able to settle on the right micro to control the networks, and in the end had to go outside the company to find a solution.

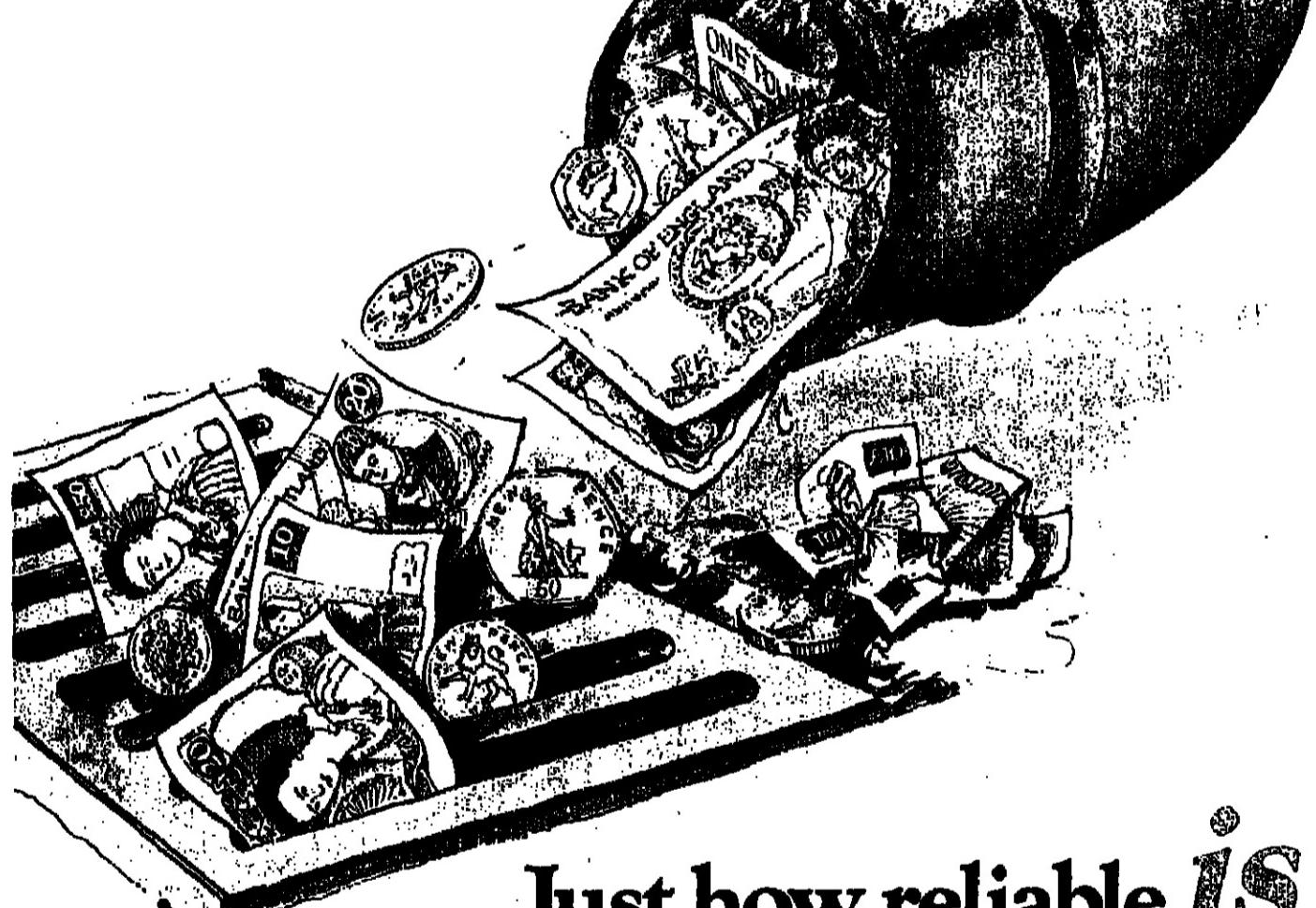
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'Protect consumers from electronic payment'

by Donald Kennett

LEGISLATION may be necessary to protect consumers from error, fraud and other ill-effects from the use of electronic payment systems, according to the Office of Fair Trading (OFT).

Speaking at EPoS 83, the fourth European congress on automation in retailing, OFT consumer affairs director Clive Newton said that the banks and the Videocon Industries Association had already provided some safeguards for consumers involved in electronic transactions.

If manufacturers, retailers and banks paid attention only to their own needs, he said, consumers could suffer ill-effects that prompted them to obstruct development which would otherwise bring significant increases in efficiency.

No definite requirements for legislative change had been identified, he said, but the risks included fraudulent debits being made from private bank accounts, incorrect debits or credits occurring because of technical faults and privacy being eroded through account details reaching third parties.

Electronic funds transfer (EFT) systems might need to be governed by such measures as similar to customers' liability and extensions to the forthcoming privacy controls to cover credit reference agencies.

Viewdata-based services should be required to give confirmation of a customer's order as a matter of course and to archive the data collected from response times.

Neilings of these requirements was included in the VIA code of conduct.



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At last — more cash for the IT campaign

by John Kavanagh
THE government is putting up £250,000 to keep last year's information technology awareness campaign going for another 18 months.

But industry people close to the IT82 campaign say the amount is far too little, and they point out that it is coming nine months after the end of last year's programme. During those nine months the government has relied on the IT82 committees to carry on last year's work on a voluntary basis.

The money will pay the salaries and expenses of 10 regional co-ordinators. They will work closely with local Department of Trade and Industry offices and with the regional committees. The jobs will be full-time but last for only 18 months.

The government has also bought two more caravans to mount mobile exhibitions on information technology. One will show an automated office and the other will concentrate on computing in re-

tailing. These will join the six from last year and tour the country. They will be run by the National Computing Centre.

"The funding is not enough," said Alan Benjamin, director of IT82 and a full-time director of software house CAP. "A regional co-ordinator won't be able to do much with £25,000."

But, he added: "They will be important in keeping local events going. And their close contact with the Department of Trade and Industry will mean the department's aims will get through to the committees immediately."

The department said there had been a lot of goodwill from committee members. People had given up their time, and companies had provided exhibition space and meeting rooms for free.

The department added that the emphasis would now be on information technology awareness among business people, rather than the general public.

Dennis Blackwell, chairman of a



BENJAMIN . . . "The funding is not enough."

British Computer Society information technology working party welcomed the plan, but said it should have been announced a year ago.

"It's a very good idea to keep the momentum going and it's better late than never," he said. "But I doubt whether the amount's much use."

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Piracy reaches the end of the plank

by Claire Gooding

SOFTWARE piracy could be at an end if manufacturers adopt the invention of an Israeli professor, Adi Shamir of the Weizmann Institute, has solved the problem of preventing people from making illicit copies of software from one disc to another with a hardware device.

The solution involves altering the disc drive so that anyone attempting to copy software will cause a machine crash. A patent has already been applied for Yeda, a development company linked with the Weizmann Institute.

Shamir, an expert in cracking protection codes, set out to find a way of preventing the most common type of software theft, whereby users simply make a disc copy of a borrowed product.

He admits that his system will not prevent determined software thieves, but points out that it is worth stopping the less expert pirates, as he estimates that 90% of business and games software is now pirated.

"It was just a question of finding the key," he said. "The system is cheap to implement and doesn't involve any modification of home computers."

Because the system uses the electronic impulses emitted by the disc drive, software companies will be able to make sophisticated use of it. Certain patterns could be built into programs so they can control the number of times the

program runs — an ideal method for software rental and companies than for over counter sales.

The system could also prevent abuse of modems, so that callers trying to tap into someone else's software could no longer software complete with data.

Shamir draws a parallel between the software and the record industry in the problem of illicit copying. But the record industry has also tried to stop pirates by making alterations to the hardware and has failed because of the technical complications. Experimenters used a noise technique, which successfully prevented discs being copied on to tape, but the sound reproduction was distorted.

This story has some relevance to Shamir's device. Several measures have been made to find his solutions to what is, in fact, aware problem. These solutions cause difficulties for software users, who may not be able to make backup copies, while such as the dongle, which is package into a particular unit, portability, which is increasingly important.

Another problem is the commercial one faced by software houses using a system that depends on manufacturers of their kit. Manufacturers are not willing to spend money on someone else's problem.

Benjamin added that IT82 had been a success. Surveys showed that public awareness of information technology rose from 17 to 62% during the year, while over 80% of business people had called for more government backing for demonstrations and education. Over 630,000 people had visited the mobile exhibitions.

Banks to share self-service

by Donald Kennett

SHARED networks of self-service banking terminals are becoming desirable and inevitable, according to the president of a leading US shared network operator.

Robert Jansen, president of Texas-based Affiliated Computer Systems, told a Philips seminar on self-service banking that the benefits of sharing terminal networks were formidable. He warned that smaller financial institutions may need them just to survive.

Automated teller machines (ATMs), whose main function was to dispense cash, had already brought benefits to single-user network operators and their customers.

ers, he said, but these would lead on to point-of-sale (PoS) systems and home banking that would make shared networking essential.

His company, whose Impact network, he claimed, was the first profitable and successful shared ATM network in the US, recognised that it would have to get together with its biggest competitor to tackle the PoS market.

The two biggest nationwide networks — Cirrus, of which ACS was a co-founder, and its rival Plus — were already discussing how to co-operate on PoS, though not yet on ATMs.

"The sharing concept has made us the number one proprietary net-

work in the US," Jansen said. "Does anyone here want to share with us? We're ready and willing."

Some of his audience of bank and building society technical and business managers doubted that experience would translate directly to the UK, as the US has 14,000 banks and the UK only 1,400.

But Jansen quoted London Banking Society chief Peter Lakin as saying that building societies provide a full range of retail financial services including ATMs.

The Building Societies Association's council was last week considering a report from CAP that recommended a consortium to operate a shared ATM network.

System cuts fuel bills in schools

by Caroline Burgess

A COMPUTERISED temperature control system in 17 schools is saving the Grampian Regional Council £200,000 a year on fuel bills — a saving of about 20%.

The first stage, costing £250,000, was installed a year ago and covered nine schools. Since then a further eight have been brought into the scheme at a cost of between £15,000 and £30,000 each.

A large number of sensors monitor temperatures, wind speeds, rainfall and the heat of the boilers. Each school has a microcomputer, which collects the information and controls the heating system.

Information is then sent to a central minicomputer via the telephone network. There it is stored on a Winchester disc, and can be viewed on a screen or printed. The minicomputer is in the council's architecture department.

Grampian Regional Council has an annual fuel bill of about £9.5 million. It hopes to extend the system to most of its 400 schools, as well as its offices and old people's homes. But money for this is not available at the moment.

Money saved on fuel bills will go to a general fund to help keep the

needs of buildings of different sizes and with different heating busses.

It is claimed that the system will save between 15 and 40% on costs, and be viable for any system after the council put the job out to tender at the end of 1982. The system was designed to meet



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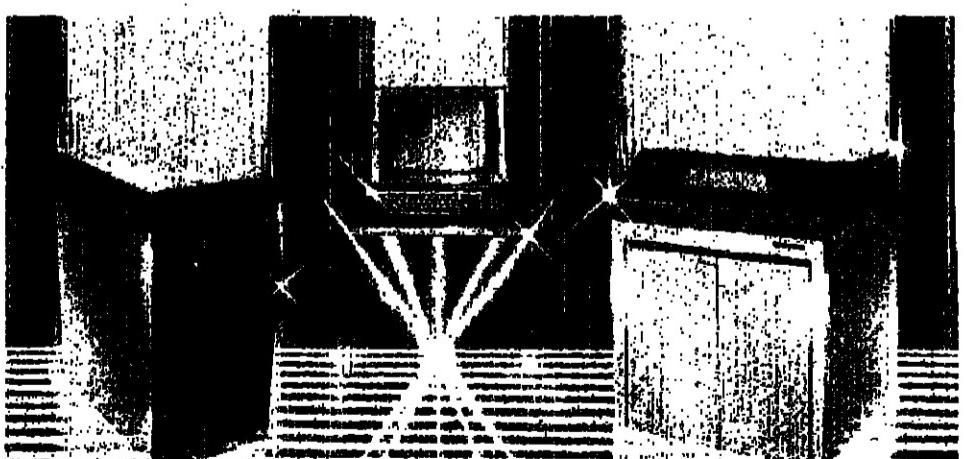
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The smaller machine holds sway at Sicob

John Riley visits France's major computer exhibition of the year

THERE are few surprises at France's largest annual computer fair, Sicob, which ends this week. The emphasis in the computer section of this Paris-based, 10-day event is on small machines, particularly multi-user and networked microcomputers.

Many of the foreign exhibits have already been launched earlier in the US and UK. This illustrates the delay caused by the language barrier in adapting machines for the French market.

Despite the increasing computer sophistication of the French public and the excellent shop window provided by the exhibition, British exhibitors were thin on the ground - only about seven companies had stands.

Several companies, including Digital Equipment, Data General and Prime Computer, presented integrated office systems. Several recently-launched superminicomputers, including Norsk Data's ND-570/CXA and Prime's 9950 machines, were also on display. The IBM System 36 had another airing - the star of IBM's stand.

Perkin-Elmer showed its 3201 32-bit processor and announced

Unix additions. Other 32-bit offerings included Data General's Desktop Generation and Gould's PS 3000 machine.

The French company, Logabax, marked its move into fault tolerant hardware with the launch of its Hyper 32, which is a revamped version of its Stratus 32 machine,

lems," said a spokesman from Tandem, the Non-Stop computer manufacturer. "It has been difficult to get the idea of hardware fault tolerance across to them."

Small business microcomputers dominated the computer section of Sicob. Most demonstrated multi-user capability or various local area network links.

NCR, which displayed its 3200 32-bit chip, also demonstrated the three buttoned mouse attachment that will be generally available on its Decision Mate V machine in 1984. The new Hewlett-Packard HP-150 touch sensitive screen macro presented an alternative way of communicating with the computer.

Osborne's stand had, as a result of the company's collapse, been snapped up at very short notice by another American micro manufacturer, Plessey Peripheral Systems, which provides the maintenance, exhibited its 7500 machine, based around the Digital Equipment VAX 11/750 32-bit minicomputer.

London-based Rain, following considerable success with its Business Computer in Germany after exhibiting it at Hannover Fair, launched the machine in France at Sicob. According to its manager in Germany, Gunther Krauss, Rain now sells more of the machines, based on concurrent 16-bit Intel 8088 and eight-bit Intel 8085 chips, in Germany than in England.

Rain's stand had, as a result of the company's collapse, been snapped up at very short notice by another American micro manufacturer, Plessey Peripheral Systems, which provides the maintenance, exhibited its 7500 machine, based around the Digital Equipment VAX 11/750 32-bit minicomputer.

This year has seen much upheaval in the French computer industry, with mergers and demergers. Consequently, the major French company, Bull, had no new minicomputer offerings, although announcements about its minicomputer strategy are expected soon. However, it has launched a network of resellers and distributors for its multi-station, 16-bit micro.

The recently formed subsidiary of the Matra Group, Matra Micro Systems, announced its plans to produce a 16-bit micro based on Intel's iAPX 136 chip, and announced an order of 40,000 of its current 16-bit micros for the education market in the French-speaking Canadian province, Quebec.

The British presence was strongest in the distributed microcomputer area. Five companies, including ICL, are now tackling head on various parts of that market in France.

ICL was at Sicob in force. It is moving from strength to strength in France - according to a French spokesman, French turnover accounts for 10% of the total company's turnover.

In the main exhibition area it exhibited its latest version of the Pergo, the system 25 Model 21, the DRS 20 Model 25, its updated personal computer and its recently launched 9518 point-of-sale terminal.

Scottish-based Future Technology Systems, which recently signed a £5 million marketing agreement with British Telecom, stepped into France for the first time at the exhibition with its Intel 8086 machine, which runs MS-DOS simultaneously with CP/M 86.

The Sicob exhibition is in its 34th year, and has become overcrowded with space scarce. The computer exhibition is crammed into the third and fourth floors, creating a waiting list for newer companies wishing to exhibit.

The organisers of Sicob have been examining another possible venue for the exhibition to the north of Paris, but so far have found no suitable alternative.



Exporters must lose their English attitude

THE difficulties for British computer companies exporting to France are exaggerated, say British companies exhibiting at Sicob. On the contrary, there are many opportunities and a lot of goodwill to exploit if British companies adopt the right attitude.

"The key to success is to make your product as French as possible," said Hans de Lange, general manager of Rain's subsidiary in France, set up last year.

"The main mistake manufacturers make is to be English in their attitudes," he added. "Screens, messages, keyboard and documentation must all be in French - that is the key to acceptance in the French market."

"We would have no chance if major calls for tender in the sector, even if we came out top," said Serge Kabakdjian, sales manager for Gepsi, Soft's distributor and himself from a French nationalised company.

"We concentrate on our companies, establish a rapport for quality and get approved for the public sector. We have an account with the Banc de France and have sold them over 80 machines," he said.

Asked why he stayed in France rather than with Gec-Shelton, explained: "But Paris, we can cover 40% of the French market in a day in the Paris region, whereas Gec-Shelton is harder. It is more spread out; you need a larger investment of the same degree of penetration."

Gunther Krauss, head of Rain in Germany, thinks, however, that the situation in Germany has changed for the top end of the microcomputer market. "Several minicomputer companies, such as DEC and Redaktron, sell mini-dealers are wide open to top end PCs," he said.

The advantage of setting up a subsidiary was explained by Chris Shelton, managing director of Shelton Instruments: "We are in the process of setting up a French company so that we can export to ourselves and retain control of the credit control documents. In

cheap translation of screen messages into any language. The keyboard is 'totally soft' too, and can easily be reconfigured.

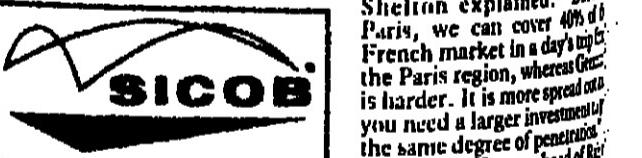
Most companies agree that it is important to set up a French subsidiary and also, if they wish to break into the public sector market, set up manufacturing facilities in France.

The prices of microcomputers are, according to French managers, general European prices.

UK compared with the UK.

"I can't understand why

distributors don't take advantage of that," he said.



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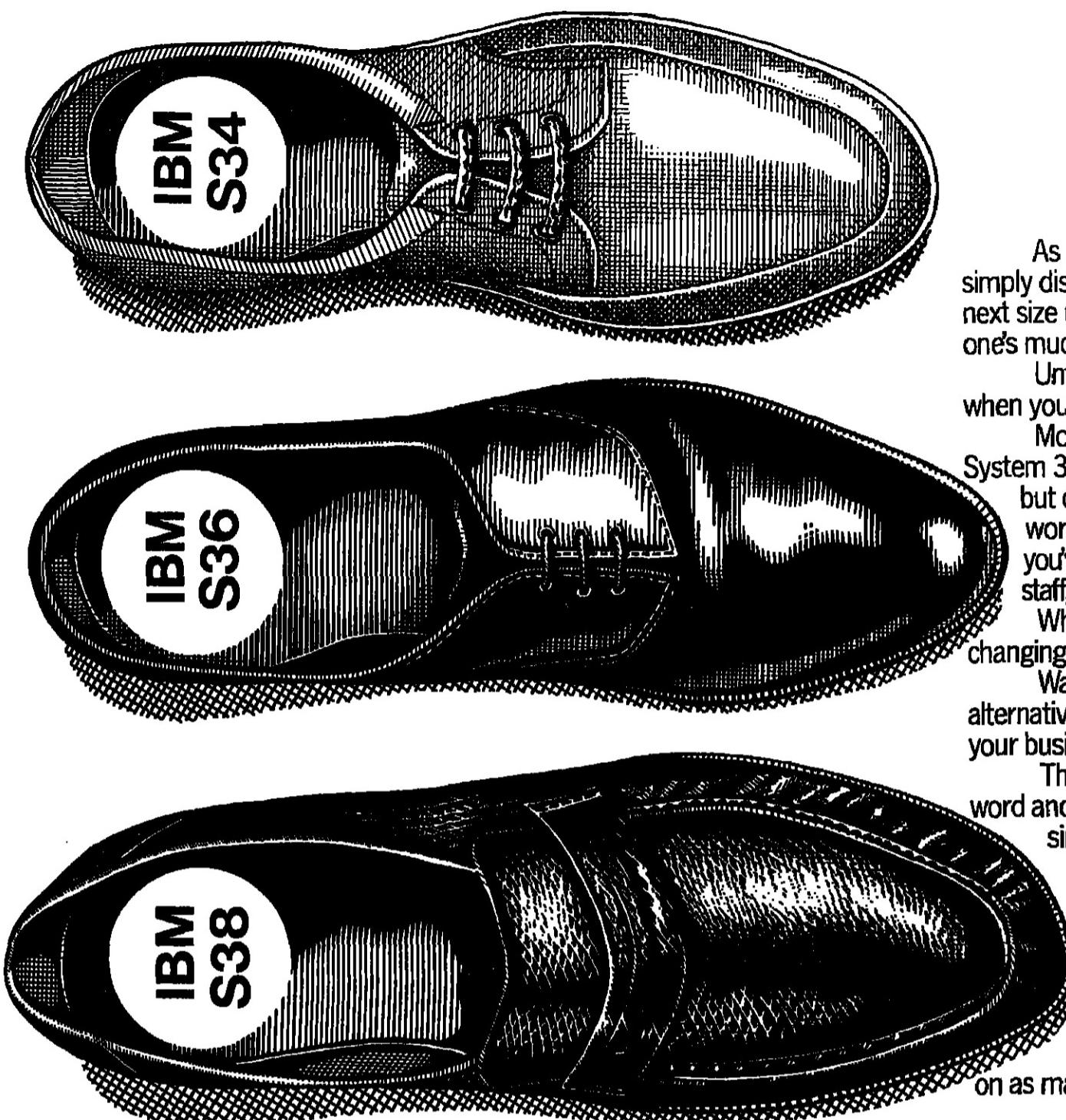
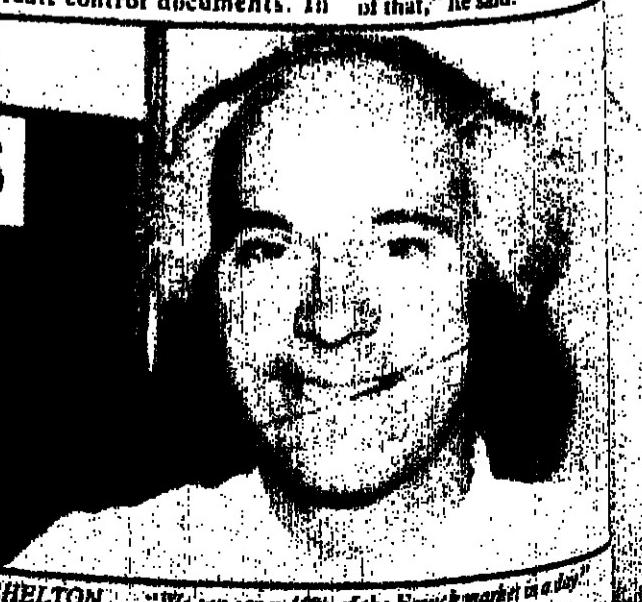
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SOFTWARE FILE

Cord pulls in NatWest upgrade

A £460,000 contract to upgrade National Westminster Bank's foreign exchange dealings system has been won by Cord Designs of Staines.

This firm came to public notice when it bought Altergo Ireland from the Altergo parent company crumbled earlier in the year. But the NatWest job has been awarded to another arm of the group, the Zeus Hermes division, which Cord acquired in November 1982.

It is the first big undertaking for Zeus Hermes since it came under Cord's ownership and will keep a systems team at the London office busy for a year.

It involves installing 13 General Automation minis at the World Money Centre and NatWest

tower, linking about 90 screens with real time Fortran and Assembler programs.

Zeus' 20 systems experts were responsible for providing the £600,000 network installed by NatWest in 1980.

Cord's identity has been something of a mystery in the industry since it surfaced alongside the much better known Data Logic, of the Raytheon electronics empire, and Thorn-EMI's Software Sciences, as a buyer of the ailing Altergo operations.

Behind it is a small London venture capital house, Innotech, which specialises in high technology investments and one of whose directors is David Sainsbury of the supermarket family.



PENNEY... Expects a revenue jump.

The partnership with Innotech was sewn up at the beginning of 1983, after Cord had talked to about a dozen financial institutions to get backing.

Cord is expected to have an annual turnover of £1.25 million when its trading year ends on September 30, but profit will be

minimal, largely because of the recent takeovers.

Marketing manager Gerald Penney expects a jump in revenue to between £4 and £5 million in 1983/4, as two major contracts, with Saudi Airlines company and United Arab Shipping, come to fruition.

Encore, which works only on

Personnel system on way to UK

A NEW personnel system, claimed to offer more detailed and comprehensive facilities than competing products, will be marketed in the UK soon.

HR+ (human resources plus) originated with Dynatronics, a small software house in Alabama, from which it was bought by the top financial packages firm McCormack and Dodge. This firm wants to include it in its forthcoming range of Millennium programs, linking IBM mainframes and micros, and has already installed it at two sites in the US.

It will be introduced into the UK towards the end of the year by RTZ Computer Services of Bristol, the Rio Tinto Zinc subsidiary which also acts as distributor for McCormack and Dodge.

HR+ is seen as posing a threat to established payroll/personnel systems, such as PPL's Cyborg system, MSA's Q-Pac, and Peterborough's Unipersonnel.

Education centre opens

A PURPOSE-built education centre in Maidenhead, Berks, run by software industry leader MSA opened on Monday.

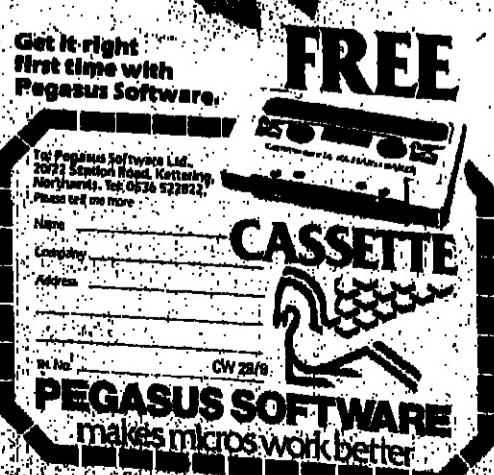
It accommodates up to 200 people, with 50 terminals for online training, as well as a lecture hall, workshops and audio-visual facilities.

Chief executive John Imlay said the centre, staffed by 15 of MSA's training division, made the firm the largest independent software education enterprise in Europe.

Software File is compiled by George Black

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Finance modelling takes an Encore

by Claire Gooding

ANOTHER financial modelling system has arrived in the UK to lure users away from well-known products such as EPS-PCSS and Micromodeller. The Encore system comes from Ferox International, which originally wrote the Micromodeller package for 8-bit machines, but broke away from UK supplier Intelligence UK earlier this year.

The new decision support system takes the principles of Micromodeller up into the 16-bit market. While Ferox is anxious that the package should be seen as a new market entry, not just a rewrite, Encore will support programs written for Micromodeller (the trade name still owned by Intelligence UK) and Ferox's own 8-bit offering, Modeler.

Encore's entry to the market is likely to trigger a price war. The most widely used system, EPS Consultants' FCSS, is selling for just under £1,000. Intelligence UK, since its bitter split with Ferox, has been concentrating on its own 16-bit package, Modeller 16, which sells for £595.

Encore, which works only on

16-bit machines, is on sale in the UK for £395. The package has been built to take advantage of bit features, such as windows, graphics and so on, with emphasis on ease of use.

According to Ferox UK's Terry Thomson, Encore offers everything that its competitor offers and more, for a much lower price. The system includes a text editor for text entry and an spreadsheet which displays windows; an English modelling language; a library; a programming language described as a developer; a report writer; a graphics and sophisticated word display facilities.

The function library has been adapted to the UK's tax and accounting laws, but, according to Thomson, Encore is short of market in the UK and sells well. "We are selling successfully against Micromodeller and are choosing it in preference to Modeler 16," he said.

Although the product has come on to the UK market October 1, Thomson has 45 orders for 45 copies.

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WORKPLACE

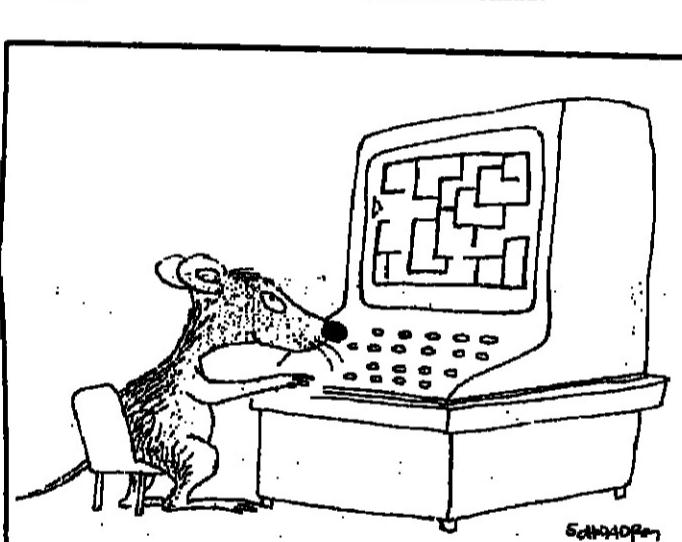
Survey shows sackings doubled in six months to April

The staff sale of the century

DEMAND for real time programmers in defence applications has rocketed in the present cold-war climate. But the employment situation in the industry generally is uncertain, and employers feel obliged to keep the staffing levels of their large data processing departments at a minimum.

In the latest survey by Computer Economics, a research company which twice a year polls 500 DTP departments employing 35,000 people, it is suggested that the number of sackings doubled in the six months from October to April 1983.

The significance of this figure is doubtful because the sample was small, but it is certain that some companies have trimmed their permanent staffs. And the pick up in the contract recruitment market this spring suggests that some firms are reluctant to rush into taking people on permanently until they are sure the recession has finished.



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County cuts crashes

THE campaign against road accidents is being boosted to one home county by a computer program that has identified the main causes of and trends revealed by 10,000 accidents. Herfordshire County Council has built the biggest UK database covering road accidents, on a Prime minicomputer.

Every accident in the county during the past two years has been recorded, with each of 99 possible contributory factors, such as bald tyres or driving too close to the car in front. A program was written to prepare statistics for a report that has just been submitted to the county's highway subcommittee.

The program has revealed that bad tyres were a contributory factor in more than twice as many accidents in 1982 than in 1981.

Workplace is compiled by Philip Hunter

Today—a woman's place is on the board

IT remains to be seen how successful next year's Women in Science and Engineering (WISE) awareness campaign will be at bringing a healthier mix of sexes into technical jobs. At present the more senior the position the less likely a woman is to be found occupying it.

But Philips Business Systems seems to have got the message, because it is sponsoring the 1983 Women Mean Business Award, along with Options magazine.

The winner will receive the handsome trophy shown in the picture, together with a well-earned fortnight's holiday in Jamaica, courtesy of the island's airline.

The burning question is: How successful have the two sponsors been at bringing women into key positions in their own companies? Options magazine has its hands clean, as it has at the helm editor Sally O'Sullivan. Philips Business Systems, however, candidly admits that women have not been very successful at finding their way into its top management. The company has five directors, 10 general managers and about 45 managers. About five of the managers are women, but none of the general managers or directors is.

The company says that it does not discriminate in either direction, but it hopes that more women will come into top jobs, and points to its sponsorship of the business award as evidence of its intent.

Whatever the final outcome, few workforces can have had so much money spent trying to find them work. But Robson hints there is a limit to how much longer the effort can go on.

Entry forms are in this October's edition of Options. Applicants receive a complicated questionnaire, which in last year's first competition (not sponsored by Philips), weeded out the feather-

females from 4,000 entries.

Applications close on November 30, after which six finalists will be chosen from a shortlist of 12, who will spend half a day explaining how they run their businesses.

Reg Parry, public affairs director for Philips Business Systems, says: "We are delighted with the success of this award scheme to help women achieve their potential in today's business world."

As part of its expansion programme following the merger with Multicenter, Multicenter has announced the addition of four senior personnel. John West (left) formerly operations manager for the CNC product range of Alan Bradley, has joined as operations manager responsible for all post-sales activities; Stuart Pole (second left) formerly with Honeywell's city branch, has joined OEM sales manager; Rod Dimmock (right) previously with Nixdorf Computer, has joined as sales executive for OEM and distributor accounts; and David Cornwell (second right) formerly with Centrefile, has joined as sales executive, end-user sales.

DIARY

SEPTEMBER 29

Intel iAP432 specialist, High Integrity Systems, is to hold a one-day seminar at the Excelsior Hotel, Heathrow. Further details from Carolynne Jones. Tel: 0279-725030.

OCTOBER 3-7

Management for Operations Staff is a Compuware Training School course at Cannock, Staffs. Cost is £465 including accommodation and all meals, not VAT. Details from J. B. Dunning at the School. Tel.: Cannock 2511.

So far, 100 such systems have been sold in Norway. Britain is working on a 16-bit version, which will cost £1,500. This will allow 10,000 records of one type, 30,000 records in total on one file.

Douglas Gilbert, who wrote part of the package, says that it will be slightly upmarket of dBase II, selling for around £700 after its first exposure to the UK market at the Which Computer Show scheduled for next January.

The company claims that Vista, unlike dBase II, is a genuine database management system, as it does not have a file structure.

All information is stored in a single file under key words, which can be used for sorting.

Any combination of sort keys can be used on one single document, which also gives it a lead on rivals.

Vista has been bench tested against dBase II on a simple application to maintain the subscription register of a magazine. There were 1,221 individual records.

There was little difference on sort and search times, but Vista was much quicker on editing, taking only one second for one sample edit compared with over six minutes for dBase II.

This, of course, is an extreme case, but the most important thing about Vista is that it is easy to use, as dBase II has often been criticised for being hard to learn.

I tried Vista myself and found it delightfully easy to generate a simple database with. If dBase II is more complicated, the comparison should not be obscured as

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JAPAN

Let's be more realistic about Japan's fifth generation project...

Progress in creating a fifth generation computer is less advanced than some people imagine. Development of a suitable language lags behind and many hard choices have yet to be made, says Hedley Voysey

ENGINEERING developments reveal fundamental transitions in their history in an interesting way. Portable power is a great idea, but changes in popularity between jet engines, diesel engines and conventional petrol engines affect other streams of engineering developments. The ramifications ripple away to change the way crude oil is refined, as well as a host of transport design systems using portable power plants.

In computing developments, transitions have roots in physical materials and their processes. The limitations on speed for computers depend on the reaction time of circuits (not the simple speed of light limitations) and this pushes along the urge to increase the density of logic packed onto a chip.

However, if power demands are too high, then there are sharp limits to this process. The search for low power designs then becomes the critical choice factor in the process of designing the hardware base for computing.

However, this physical base for computing engines is complemented by a powerful notational base. The way that the hardware designers look at more complex assemblies of processing elements is limited by the power of their descriptive tools, whether these are graphical languages, or languages closer to conventional programming formats.

There is also a need for notations and languages to support the implementation of procedures and specifications being executed on processors capable of working in parallel.

As the whole thrust of shifting the spread of artificial intelligence (AI) achievements into everyday practice depends on lavish logical processing power on these methods, there is a hunger for

massively powerful parallel machines.

The reasoning behind the Japanese belief in the existence of a fifth generation of complete concepts in computing stemmed from their assessment that a sharp transition in the notational (or programming language) base was necessary.

Their idea was to mesh the developments in hardware and software, so that they kept in step with each other.

If this reasoning is correct, then the choices being made in the programming language field by the Japanese may be crucial to their success in maintaining the coherence of their plan.

The original span of 10 years to make the major transition to a new generation has now been subdivided into three phases - the first run for three years and the second for four years - leaving three years to put the act together.

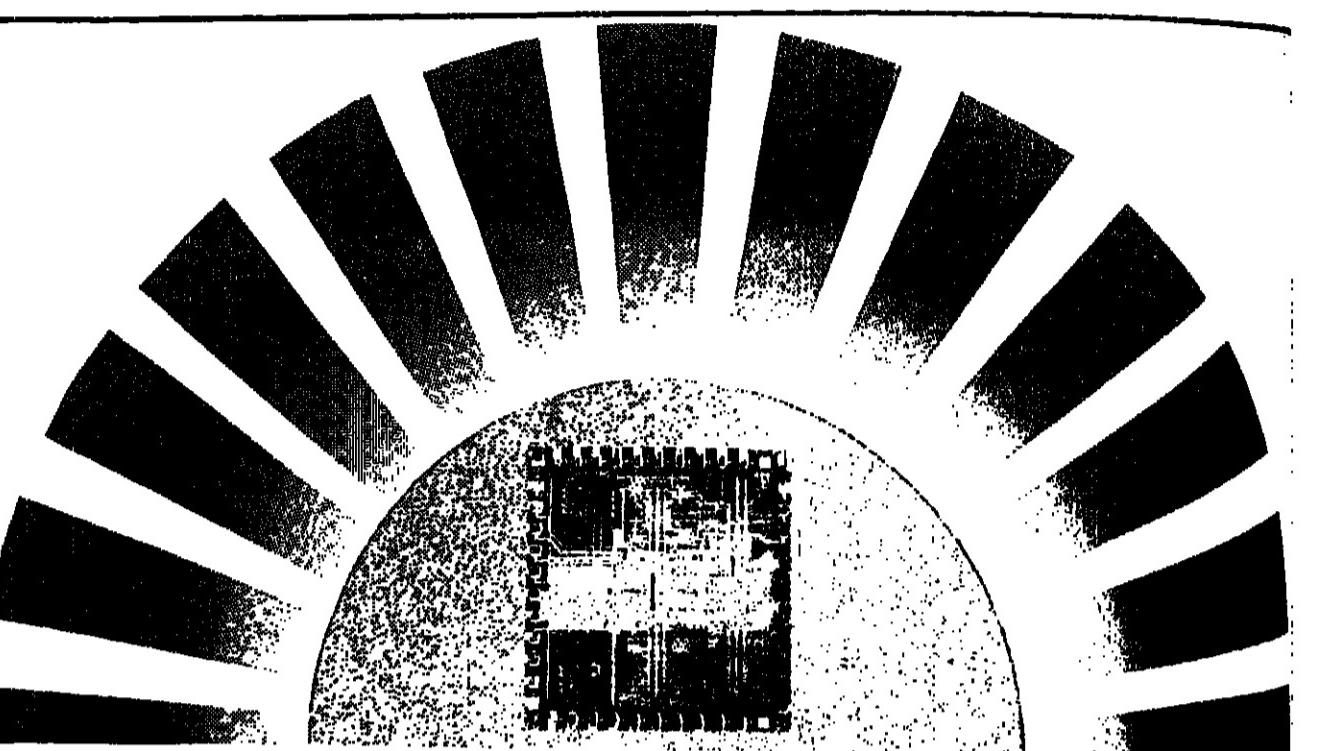
Although the view of the Institute for New Generation for Computer Technology (ICOT) are often taken to be the sole view of the Japanese when making critical choices in computer architectures, the truth is more subtle.

Nevertheless, it is ICOT which has set out its plan clearly, so it acts as a yardstick for other groups, both in Japan and in the rest of the world, to choose to measure themselves against.

ICOT has established eight sectors of work, which range all the way from studies of "inference functions" down to designing in very large scale integration (VLSI), using artificial intelligence techniques.

A powerful case for the coherence of the Japanese set of choices as made by ICOT was put forward recently by Shunichi Uchida.

The actual construction of test



beds of the selected couple of computer architectures does not start until the 1985/86 period. Therefore, the evaluation of performance and feasibility made then will be a time when the project will either gather pace or be subject to some critical reassessment.

The two basic mechanisms to be tried out are an inference mechanism and a knowledge base mechanism. The putting together of these two to form the prototype of the fifth generation computer is not planned to be done until the final phase of the project, which is due to start in 1989.

The Japanese choice for the kernel programming language has been "logic" programming, based on the Horn clause version of predicate calculus ideas. The strong link, due to the underlying use of predicate calculus, between this style of specifying actions and the relational database view of knowledge is the twin which binds the two streams of studies in

One of the priorities is to get a faster version of Prolog up and running. The raw speed of this PSI cannot be very great, as the micro instruction cycle is not much less than 200 nanoseconds, with a mere 64 bits of width for each micro order.

Although the Japanese are as interested as everyone else in trying for some extra power by developing "extremely long instructions" for microcode, there are no plans yet to boost the PSI to

one of the more immediate tasks is to extend Prolog to enable it to be used for systems programming. The studies to find a fully parallel language are much more long term, as is the parallel version of the inference computer.

As the Prolog language already exists to support logic programming, the Japanese regard this as a starting point. An entire group of the ICOT staff of about 40 people, however, is devoted to kernel language development. They are aware that developments in logic programming are absolutely essential - especially for some problems in artificial intelligence.

The key point to emerge from Uchida's presentation (which apparently surprised some US delegates to the Stockholm meeting on VLSI, where it was given in June) was that very little is fixed in the Japanese plan for the fifth generation project.

Work at the Musashino Laboratory of Nippon Telegraph and Telephone (NTT) shows how much the Japanese are hedging their bets about "languages of the future". These NTT researchers use a simple Lisp-based machine (comparable to the US original Lisp machine), which uses a 32-bit machine, although eight-bit are again absorbed for tags.

The machine design studies range across dataflow machines, as pioneered at the Massachusetts Institute of Technology, to reduction machines, as pioneered by the West Germans.

Uchida is blunt in expressing the view that the language developments are well behind what is

needed to develop hard and fast architectures for a fully parallel inferencing machine in the later 1980s.

As the researchers have to work on something, they are getting a fairly primitive sounding Personal Sequential Inference (PSI) computer.

The PSI is a 40-bit machine, which may be thought of as a 32-bit engine with the addition of an eight-bit tag. The memory size is to range from four to 16 million words of 40 bits, and it should run Prolog about as fast as some of the existing machines in universities.

What the NTT researchers have spotted is the same sore point that Uchida stressed. We need to evolve programming description tools (both the languages as a set of features and as a reflection of the underlying model for computation) to suit both the experience of programmers and the variety of problems they are required to solve.

Oddly enough, the Japanese way of approaching things is closer to the UK way of developing this line of research than is commonly supposed.

Phil Treleaven of Newcastle University presented a paper at the Stockholm meeting on the choices to be made in building highly parallel machines. He said that the Japanese emphasised the discontinuity between current styles of computing and the fifth generation aims in computing, based on logic programming.

All the detail given by Uchida on studies on designing a fully parallel inferencing machine indicates that most of the large or hard choices are a long way from being made yet.

That is hardly surprising, but it adds a dash of reality to some of the wilder sorts of story being touted about the Japanese work at ICOT and the eight manufacturers fitted into the fifth generation project.

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To Michael Rogers Computer Weekly, Room 211A Quadrant House, Sutton, Surrey SM2 5AS

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be compatible with either Lisp or Prolog.

They have also turned towards

object-oriented programming, represented by languages such as SmallTalk, by allowing message passing, plus some interesting ways of classifying messages.

The same evolutionary line

of the Japanese emerged

as during the workshop at Edin-

burgh University covering develop-

ments in low power consuming

which basically consumed

complementary metal oxide

con (CMOS) progress.

As Professor Jonathan May of the Massachusetts Institute of Technology said: "The molecular arsenide chips will move very fast to keep up with the best work being done in CMOS."

The Japanese represent

from Toshiba and Nippon

concerned. Both the US per-

and the Japanese were impressed

by achievements presented

at.

To everyone's surprise, the

panes were also impressed

success of the UK's colossus

venture in exploiting CMOS

build up to 5,000 gate array

order.

Phil Treleaven stressed the need to keep

foot in the past experience of computing, while

searching for a toe-hold in more highly parallel

ways of describing programs

parallel machines. He said that the

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[JYH] 1/10

DATA STORAGE

Stick by what you know works . . .

... because keeping pace with technology is not for the faint-hearted, reports Keith Holder

THE demand for storage peripherals continues to grow, according to one report from Freeman Associates, which predicts a growth rate of 23% over the period 1982-87.

Keeping pace with this demand in terms of technological improvements is not for the faint-hearted, particularly as recent developments with both floppy discs and optical storage systems threaten to change the face of the storage market. As with any fiercely fought technology battle the race to get a system into production is conducted at breakneck speed and often leads to a spate of similar "breakthroughs" hitting the marketplace simultaneously.

Yet for all the advances there still remains a market for the older technologies and systems which, if nothing else, represent a known quantity for performance.

Oldest by far is the magnetic tape which, though superseded in performance, remains popular with a lot of users. IBM found this out to its cost when it launched an all-data-online campaign to impel users to change to disc storage.

The campaign was a dismal failure attributed to the huge investment many users have in tapes and their satisfaction with tape performance. Another cause was the failure of IBM and plug compatible rivals to deliver mass storage disc systems such as the 3380 on time.

Improvements in tape capacity and reliability have also been impressive, reaching a maximum density of 6,250 bits an inch and speeds of 200 in a second. Improved production techniques have also yielded lower error and loss rates through better control of oxide particle voids and tape distortion.

Tape drives have improved too; with better servo mechanisms and error detection systems. Progress has also been made in reducing head wear caused by the higher tension needed for high density tapes. For extreme environmental applications, Wabash Datatech has developed a tape which will operate virtually error free in extremes of heat and cold.

A compromise between tape and disc systems comes in the form of the IBM 3850 and Massstor M860 mass storage subsystems. IBM had a six year head start over the competition, though sales of this system have been disappointing.

Frost and Sullivan put the European total at no more than 750, though Massstor's offering is said to be making better progress. These devices are designed to re-

duce the time for retrieving information from very large tape systems and consist of "boxes" of several hundred cartridges, each with a 70ft long strip of tape coiled inside which is accessed by a central arm or trolley.

The floppy disc is, and will probably remain, the fastest growing area of storage technology but, partly because of this, users are now faced with a bewildering choice of different sizes, capacities and so-called standards. The capacity offered by these devices has risen sharply. Drivetecc's 320 "superminifloppy" already offers 3.3 Mbytes on a 5 1/4 in disc and Amlyn plans to release a 16 Mbyte 5 1/4 in drive by the end of the year.

Progress has taken two forms, firstly with improvements to the disc media itself resulting in higher track densities (196 tracks per inch) and storage capacity.

Secondly, in order to make use of these disc developments, drives have undergone several refinements to allow better track following, taking into account environmental changes in the disc material, and positive centring of the discs.

The high density discs, currently available from a number of manufacturers, including BASF, Dysan, Memorex and 3M, use iron oxide particles impregnated with cobalt in coating thicknesses around one micron to achieve their performance.

Tabor, for example, has a 3 1/4 in device which holds 500 Kbytes using 140 track per in disc. A three inch drive is available from Hitachi, Hitachi Matsell and Matsell.

This type of closed loop drive has been achieved in a number of ways though the basic method is similar in all cases. The servo receives information from a reference track located outside the data storage tracks which continually updates the positioning of the head to compensate.

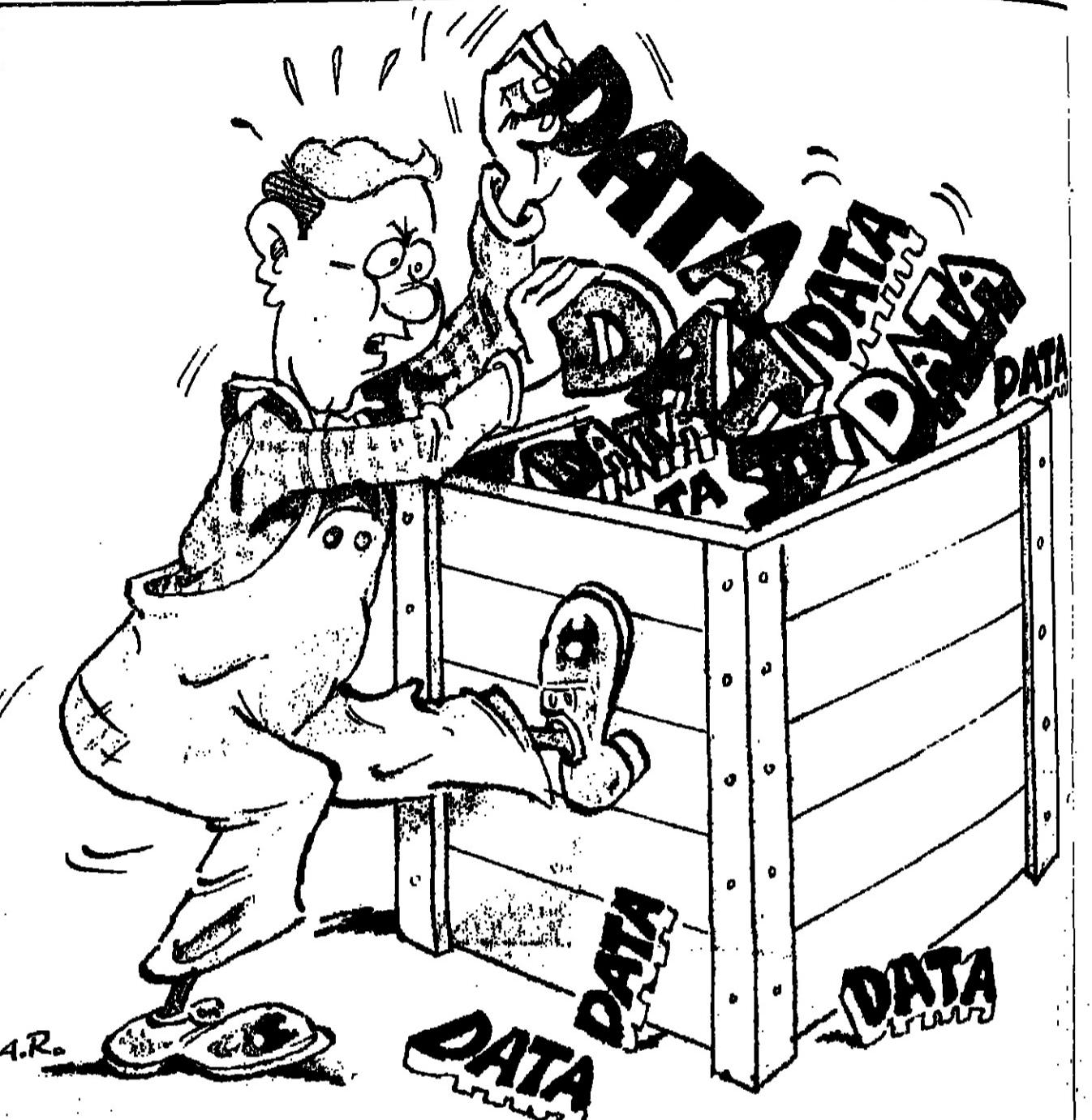
This type of closed loop drive has been achieved in a number of ways though the basic method is similar in all cases. The servo receives information from a reference track located outside the data storage tracks which continually updates the positioning of the head to compensate.

Drive's system, for example, is based on this by comparing two signals from adjacent tracks and, via a microprocessor, alters the positioning of the head until the signal intensities are equal.

While many of the manufacturers have made their sub 5 1/4 in offerings compatible with the larger drives the IBM 3 1/2 in drive is not.

Development in eight inch drives by comparison has been virtually non-existent.

The sole exception to this is the Iomega Alpha-10 which uses a special track medium to allow about 300 tracks an inch, in-



improve contact between disc and head. The addition of hub reinforcement rings and refinements to clamping devices in drives has led to better control over disc centring.

In terms of disc devices at the very high capacity end of the market nothing has yet appeared to match the IBM 3 1/2 in's 2,500Mbytes. Though this device took a long time to appear and was subject to a plethora of delays and production hiccups, when it did finally get into service user comment was very favourably on its performance and reliability.

The market has been alive with rumours from rival manufacturers about optical disc storage devices. Erasable discs are already developed and around 10 major manufacturers are at an advanced stage with prototypes and customer trials well in hand.

Tabor, for example, has a 3 1/4 in device which holds 500 Kbytes using 140 track per in disc. A three inch drive is available from Hitachi, Hitachi Matsell and Matsell.

The consensus is that great things are afoot but it may be worth sticking with what you know will work today.

sheets which uses a hard shell disc. In the battle for standards on the sub 5 1/4 in market many companies are looking to IBM to provide a lead and some are keeping their options open until IBM makes its move, as the plug-compatible market will certainly provide huge potential sales.

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Development in eight inch drives by comparison has been virtually non-existent.

The sole exception to this is the Iomega Alpha-10 which uses a special track medium to allow about 300 tracks an inch, in-

bedded servo positioning and rotational speed five times that of other eight inch drives to achieve a 10 Mbyte storage capacity.

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late the 3380. Storage Technology announced that it had updated its 4205 CMOS solid state unit this month and deliveries will not take place until spring next year.

This is not only not a disc device but offers a mere 192Mbytes storage. The company say it is offering this lower capacity to allow users greater flexibility particularly if IBM stops supporting the 2305 drive. Another reason given for not pursuing high capacity was that the running optical disc systems will take care of that market niche and Storage Technology said it may introduce its own optical disc system at the end of 1985.

The benefit gained by this are twofold as not only does the head give an error-free reading throughout the disc surface but the reliability achieved when changing from one disc to another is also improved.

Read/write head geometries have also come in for attention to eliminate excessive head wear and

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DATA STORAGE

Why secondary storage costs are increasing in significance

But, as Owen Hanson writes, the choice is not a simple one and is not becoming any easier

AS THE cost of main storage and of CPUs moves relentlessly down, the relative cost of secondary storage - discs, tapes and mass storage devices - grows even more significant. For discs, we are constantly told that the cost of storage per byte is far lower than it used to be,

care, there should be no problems with tapes.

Despite the virtues of tapes for high bit-rate sequential files, the main problems users experience with direct access devices are inherent in the devices.

Large numbers of hard discs are available for microcomputer systems, but they are not well suited in business needs.

Backup provision often relies entirely on floppy discs, with 10-30 such discs needed to copy the whole of the hard disc for security purposes.

Many systems rely on cartridge tapes, which are relatively slow and far less reliable than the device they are backing up (as are the whole of the hard disc for security purposes).

Only a few units offer the option of a removable disc to back up the fixed part of the unit. The best known of these are CDC's 9454/9455 Lark, an eight inch unit with an unformatted capacity of 8 + 8 Mbytes; DMA System's Micro-Magnum, which is a 5.25in, 6.75 Mbyte unit; and the

3775s with a disc controller.

More than three years ago, IBM launched its all-data-online campaign to move users from tape to disc storage. The campaign was not successful, partly because of the huge investment many users have in tapes; the satisfactory performance of those tapes and their users' intention to go on buying buying and using tapes.

The campaign also failed because IBM and its competitors did not deliver 3380 and their look-alikes on time. Now these delivery problems have been overcome, users could switch entirely to direct access storage, but, this would not generally be cost-effective, as most installations still have a lot of sequential files in use for which tape storage is highly satisfactory. Recent surveys by Rekha Patel and S. M. Woo of the City University showed that between 80 and 90% of users have sequential files in operation at the present time.

One user has been able to keep both hard and soft errors on tape down to a maximum of one hard and three soft errors in three months. Given this level of performance, it cannot be said that tapes are unreliable, although not every user can compete with this success rate. To do so, it is necessary to log every error on a tape, and use tape certifier and tester devices to ensure that tapes are operating correctly and to identify lengths of tape that are causing problems. But, with this level of

access time, the 3380 is not

be under the access heads at one time than in the past. But file sizes have increased, so the figures show a serious weakness. And, because of the advent of virtual storage systems, page datasets, which are much smaller than the capacity of modern devices, are so active that all other datasets on the same huge volume are virtually unusable.

It is fashionable to say that the speed of modern equipment is so great that there is no need to be careful with data files or system design. For disc files that has never been less true. Huge capacities inevitably lead to head contention, as most users know to their cost. How many users have bought the big new discs, believing that their problems would be solved only to find they were not?

New World Computer's 5.25in, unit of four Mbytes + a two or four Mbyte removable cartridge. Eventually, of course, all hard disc manufacturers will be driven in this direction, and many users feel that the sooner the better.

A better method of disc design

would have been to increase enormously the number of channels and access mechanisms, keeping the capacity of data storage swept by a single access mechanism to a minimum. Manufacturers went the wrong way, but all is not lost, because of the advent of disc cache and semiconductor disc storage.

Semi-conductor disc storage, with an access time seven times that of fixed-head discs, and about 100 times that of the 3380, first appeared in 1978/9. Table 2 shows figures for the STC 4305 and the Intel Fast 3805 storage devices.

These devices can be used either to handle operating systems and page dataset files, or for larger file storage devices as front-end processors.

Although they are not being used by many companies, those users who have them seem very satisfied with their reliability and performance and point to marked improvements in performance.

The second alternative is disc cache storage, aimed at front-end processing. IBM offers the 3880/11 disc control unit, with eight Mbytes of semiconductor storage that can be used with 3380s to handle paging data, and the 3880/13, which can have four or eight Mbytes of cache storage to handle application file data on 3380s.

Although there is a small benefit for direct applications, the greatest

Device	2311	2314	330-1	330-11	3350	3380
Date	1964	1967	1970	1973	1977	1981
Capacity (MB)	7	28	100	200	317.5	630
Transfer rate (BPS)	156K	312K	806K	806K	1.2M	3M
Average access time (ms)	87.5	72.5	38.3	38.3	33.3	24.3
including head movement and rotational delay)						

Table 1: Access time of discs

Device	STC 4305	Intel Fast 3805
Access time (ms)	0.3	0.4
Capacity	11.25-90	11.2-72
Transfer rate (BPS)	1 M, 1.5 M or 3.0 M	1.5 to 4 M
Compatibility	3380	3380, 3350

Table 2: Semiconductor access time

Device	Braegn 7110	IBM 3850	CDC 38500	Massstor M860
Capacity	808 to 7808	35,000Mbyte	16,000Mbyte	55,000Mbyte
Range	reels	472,000Mbyte	1,000,000Mbyte	440,000Mbyte
	144,360Mbyte	min	max	max
	1,405,440Mbyte	max	max	max
Data access time (seconds)	15-20 to mount only	8-13 range	7.5 average	7.4 average

Table 3: Massive storage devices

There has been a very great increase in capacity per access head, and in data transfer rate, over the last decade. This has not been matched by the modest improvements in average access

DATA STORAGE

More and more people are finding their way into storage

John Aczel finds that UK production of storage units is growing and sales are increasing

	Jan-	June-	Jan-	June-
	1983	1982	1983	1982
	£'000	£'000	£'000	£'000
Belgium-Luxembourg	1,965	839	1,965	839
Canada	741	448	741	448
Denmark	1,536	1,246	1,536	1,246
France	4,061	1,858	4,061	1,858
Germany (West)	29,517	11,681	29,517	11,681
Ireland	1,397	807	1,397	807
Italy	2,147	1,563	2,147	1,563
Japan	10,318	2,266	10,318	2,266
Netherlands	4,743	4,927	4,743	4,927
Portugal	4,445	3,446	4,445	3,446
South Africa	170	253	170	253
Sweden	468	169	468	169
Switzerland	227	N/A	227	N/A
US	57,651	44,641	57,651	44,641

Table 1 - British imports of disc storage units by main suppliers (by value)

	Jan-	June-	Jan-	June-
	1983	1982	1983	1982
	£'000	£'000	£'000	£'000
Belgium-Luxembourg	911	464	911	464
Denmark	80	20	80	20
France	219	147	219	147
Germany (West)	698	1,094	698	1,094
Italy	57	21	57	21
Japan	658	-	658	-
Netherlands	566	495	566	495
Norway	43	33	43	33
South Africa	75	11	75	11
Spain	2,014	2,165	2,014	2,165
Taiwan	307	866	307	866
US	16,536	10,652	16,536	10,652

Table 2 - British imports of magnetic tape storage units by main suppliers (by value)

	Jan-	June-	Jan-	June-
	1983	1982	1983	1982
	No.	No.	No.	No.
Belgium-Luxembourg	446	498	446	498
Canada	503	372	503	372
Denmark	162	109	162	109
France	3,108	2,427	3,108	2,427
Germany (West)	17,511	6,403	17,511	6,403
Ireland	3,019	803	3,019	803
Italy	1,298	2,166	1,298	2,166
Japan	93,216	10,502	93,216	10,502
Netherlands	11,862	11,882	11,862	11,882
Portugal	1,318	1,330	1,318	1,330
South Africa	58	143	58	143
Sweden	538	382	538	382
Switzerland	4,752	77	4,752	77
US	96,283	41,485	96,283	41,485

Table 3 - British imports of magnetic disc storage units by main suppliers (by number)

	Jan-	June-	Jan-	June-
	1983	1982	1983	1982
	No.	No.	No.	No.
Belgium-Luxembourg	1,196	169	1,196	169
Denmark	16	4	16	4
France	39	62	39	62
Germany (West)	16,122	6,236	16,122	6,236
Italy	7	3	7	3
Japan	21,559	-	21,559	-
Netherlands	2,251	233	2,251	233
Norway	155	135	155	135
South Africa	10	4	10	4
Spain	316	352	316	352
Taiwan	23,800	44,850	23,800	44,850
US	20,019	4,377	20,019	4,377

Table 4 - British imports of magnetic tape storage units by main suppliers (by number)

	Jan-	June-	Jan-	June-
	1983	1982	1983	1982
	£'000	£'000	£'000	£'000
Australia	82	74	82	74
Belgium-Luxembourg	1,662	450	1,662	450
Canada	55	126	55	126
France	6,166	4,425	6,166	4,425
Germany (West)	9,414	5,623	9,414	5,623
Ireland	2,150	1,055	2,150	1,055
Italy	5,779	4,137	5,779	4,137
Japan	546	309	546	309
Netherlands	1,773	594	1,773	594
Sweden	1,341	613	1,341	613
Switzerland	1,059	715	1,059	715
US	7,791	2,462	7,791	2,462

Table 5 - British imports of disc storage units by main suppliers (by value)



Things are looking up in the storage world - demand is growing for both tape and discs

SALES of storage units in Britain have continued to grow rapidly and demand has gone up faster than expected. Imports have been buoyant and have captured a bigger share of the overall market.

Up-to-date information about the level of demand for storage units is not easily available and there are big gaps in the official statistics. But it is possible to estimate the size of the market by collecting various statistics, particularly those on imports, exports and production.

There are two main sectors of the market - disc storage and magnetic tape equipment - and the former is the more important. For both products, the market in 1982 was between £200 and £250 million at manufacturers' prices.

Continental sales of disc storage units have remained at a fairly low level, though the Netherlands, Germany and Switzerland have been active in the British market.

British exports of disc storage units went up to £121 million in the first half of 1983 - a rise of 60% over the same period of 1982. For 1983 as a whole, it is expected that deliveries will be worth about £250 million, as against £160 million in 1982.

According to some analysts, the value of the storage unit market is rising by about 40 to 50% a year, as a result of the rise in demand for various types of computer, especially micros.

Most of Britain's requirements for storage equipment are satisfied by imports but there has been a steady increase in production in the UK. Official figures show that production of storage equipment rose to about £75 million in 1982, against £70 million in 1981. For the first quarter of 1983 the figure was £20 million, continuing the upward trend.

During 1983, UK production should continue to rise and the full 1983 figure could be 10% higher than in 1982, at about £80 to £85 million, with most of this being disc storage units.

Much of this output is being exported, with sales abroad amounting to nearly £60 million in 1982. Some of this may represent re-exported products, mainly from the US, but, if these figures are correct, they suggest that 80% of the UK throughput is now being sold abroad.

Home production is insufficient to meet the requirements of the fast expanding British market, so imports have been capturing a bigger share; and for some products, this was about 90% of total sales.

Competition in the computer storage market has been tough and

prices have been coming down rapidly. In the first half of 1983, the average price of an imported disc storage unit dropped to around £500, as against £1,000 a year earlier. Magnetic tapes have also been dropping in price - at about 20% a year.

These prices are part-of-entry prices. The price to the user includes retail and wholesale margins, and distribution costs. Nevertheless, the trend has been sharply downward, even though sterling has been weak against many other currencies. Foreign suppliers have been willing to drop their prices in sterling terms to secure higher volumes.

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DATA STORAGE

How to make some massive savings

Paul Walton considers a compromise technology invented by IBM

MASS storage is a compromise technology invented and first sold by IBM. Massstor recently became the first vendor to offer competition to it.

Mass storage subsystems, to give them their full title, reduce the access time for retrieving information from very large (often hundreds of gigabyte) magnetic tape systems. They are a compromise between the cheap, but slow and cumbersome magnetic tape and the expensive but faster disc drive.

IBM has been selling its 3850 mass storage subsystem for seven years and has notched up a base of no more than 750 in Europe, giving them their full title, reduce the access time for retrieving information from very large (often hundreds of gigabyte) magnetic tape systems. They are a compromise between the cheap, but slow and cumbersome magnetic tape and the expensive but faster disc drive.

Langton's computer centre is the scientific bureau for universi-

ties in the south of England. Manchester handles those in the north. Both centres store an enormous amount of information on behalf of clients. Manchester has already taken a Massstor M860.

The London computer centre does number crunching for those elected users on an Amdahl V8, which front ends the main Cray-1 central processor. He told Computer Weekly about the two radically different approaches: IBM uses its 3850 as a sophisticated back-up for existing discs, while Massstor uses magnetic tape and bypasses the need for discs.

Langton has two storage problems. The first is that, because of high cost and lack of space, he cannot buy more disc drives to provide the increased storage needs. So he has to increase the number of magnetic tapes used to archive information. Even with strict rationing, these tapes proliferate. If the information held on them is to be accessible some form of automatic tape access is needed.

Commercial sites have much the same problem, which most overcome by more rigorous archiving or by bearing the cost of disc drives: witness despondent users awaiting greater capacity IBM discs during the storage famine of 1981-1982.

Brian Burch, vice-president of Massstor, pointed out the need for some form of intermediate storage medium in a paper he gave to the IBM User Show earlier this year. He said that most organisations have three types of data to store: high activity files accessed frequently and best stored on discs; large and infrequently accessed files best stored on tape for loading when needed; and an intermediate set of files, eg a test file which is active for weeks and then not used for several weeks.

According to Burch: "There is a distribution of file types in any organisation - some used a lot, some not at all. But the bulk are of the intermediate type."

"What most users do is to cut that distribution of files down the middle. On one side they buy expensive disc; on the other side they buy tape, which is used manually. Storage then becomes an economic

decision based on cost. People end up spending more on storage than they should."

They end up paying a premium for the fast access disc, which they don't really need. If you wanted to use a file which hadn't been touched for three weeks and you were in no hurry, then a one second access time is a waste of money."

Burch added that it was hard to educate users that mass storage, wherever they buy it from, is ideal for this intermediate storage of the bulk of their files. He said that this would cut a third off the price of their disc storage, with access time only slightly slower, at 10-20 seconds.

Langton agreed that most files are intermediate ones, and stressed the cost of operator intervention (tracking down and then loading the magnetic tape by hand) or the cost and space problem of adding discs. Files archived on tape might never be seen again, he said. They were effectively forgotten or lost.

Mass storage subsystems address this need. They are boxes consisting of several hundred cartridges, each with a 70ft long, 2in wide strip of magnetic tape coiled inside. Information is stored on the tape, which is automatically accessed by a central arm (for Massstor) or trolley (for IBM).

Langton has just ended an exhaustive review of his centre's data storage needs, and IBM and Massstor have submitted tenders to win his business. He says that mass storage subsystems are cheaper than disc in every respect, and faster than magnetic tape.

The University of London is looking for a 100 gigabyte system, which will cost about £600,000. Equivalent discs would cost a half to a third more, and there would be delivery problems for high capacity models.

Reducing overheads, such as operator intervention, is not the only aim. Access time is important too. The mass storage subsystems each take around 10-20 seconds from a request for information to getting the first piece of it through and Langton. This compares with 40-50 milliseconds for a set of disc

Inside Massstor's mass storage subsystem.

drives holding the same amount of data, and the unknown time of finding and loading magnetic tape. Space is becoming expensive, as the number of disc drives or special peripherals increases, and often it is not possible to rearrange the configuration. Mass storage subsystems are several times smaller than the discs or tapes they replace.

IBM's 3850 is 20ft long, 4ft wide and to 5ft high but expanding the storage capacity can be difficult. Langton explained that, as IBM uses a small trolley, which has to run backwards and forwards in a straight line between the cartridges, expansion can only be in one direction. Adding 50 gigabyte extensions to the basic 100 gigabyte model can expand it from one wall to the other, curtailing further expansion.

Massstor supplies a virtual magnetic tape system, and this software is needed to work on faster intermediate disc drives.

The idea, said Langton, is to automate the handling of virtual tape drives, with automatic mounting of the one you want to use.

IBM has advantages over Massstor because it sells a complete package of hardware and software, which can use intermediate faster discs to design more evenly balanced systems. The 3850 was built to work with 3330 IBM discs (and their upgrades). Massstor's M860 is a direct tape storage system, which needs third party software to work with disc drives.

IBM treats the 3850 as if it were a set of virtual, or temporarily used 3330 discs. The central processor calling for information reacts as if the 3850 were simply slow disc drive. Massstor treats the M860 as virtual magnetic tapes, each of which are listed in a directory and accessed directly by the processor.

While it is possible to use the 3850 simply as a magnetic tape store, most users buy the additional hierarchical store manager (HSM) program so they can use it with discs. This utility moves any file on disc which has not been accessed for some time over to what it thinks is a virtual disc - the 3850 cartridge tape. When the file is again requested, it comes back to a fast disc in anticipation of regular use and the need for rapid access.

But there are drawbacks with HSM. There must be enough real disc storage available to store both real and active files, where they are being held. Once the number of files entered reaches the

real storage limit outside of 3850's virtual extension, trouble occurs - ie the HSM tries to create space on the disc drive constantly moving files back and forwards between the disc and the mass store.

IBM developed the 3850 as a storage system as an aid to its operation, usually under a multiple virtual storage (MVS) operating system. It manages the problem of storing files more intermittently by creating an virtual disc storage space for 40-to-50 operations. Langton claims that it is not intended to expand storage you haven't got.

Massstor supplies a virtual magnetic tape system, and this software is needed to work on faster intermediate disc drives.

The idea, said Langton, is to automate the handling of virtual tape drives, with automatic mounting of the one you want to use.

Massstor's M860 is being sold primarily to IBM MVS users, it is possible to extend its use to big machines by writing its interface software. (The M860 can be accessed by Control Data, Honeywell, Sperry and Digital Equipment machines.)

The M860 comes complete with the store management and HSM software, which is used to find access to the virtual tapes via half of the central processor. Massstor is being sold primarily to IBM MVS users, it is possible to extend its use to big machines by writing its interface software. (The M860 can be accessed by Control Data, Honeywell, Sperry and Digital Equipment machines.)

The M860's main disadvantage is that working directly with magnetic tape is very much slower than having intermediate faster disc drives.

Mass storage subsystems are several times smaller than the discs or tapes they replace.

IBM's use of virtual tape techniques means that required information can be obtained through the fast discs and not the slow tape drives.

Langton has begun tests however, at third party sites, which will allow the Massstor M860 to be connected to the fast disc drives.

Mass storage subsystems, using existing technology, can offer rapid access of disc to the cost of tape. It is possible to compete with IBM and the increasing demand for data may result in their being held. Once the number of files entered reaches the



BURCH... Users cut distribution of files down middle.



LANGTON... His problem of high cost and lack of space.

graphics VDUs

viewdata terminals

voice, input/output

workstations

cases

integrated circuits

keyboards

memory

passive devices

peripheral controllers

printer mechanisms

recording heads

access, security & safety

card punches

environmental control

furniture

magnetic media

microfiche

microfilm

physical storage

power supplies

stationery

test equipment

point-of-sale

controllers

gateways

encryption

interfaces

local networks

message switches

modems

acoustic couplers

multiplexers

network management

PABXs

protocol, code & speed converters

telefax

test equipment

viewdata

teletext

voice and wideband

wide-area networks

calculators

local processing terminals

mainframe computers

microcomputers

multi-user microcomputers

16-bit minicomputers

32-bit minicomputers

word processors

line printers

impact matrix printers

ink jet printers

furniture

magnetic media

microfiche

test equipment

software systems

controllers

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tape transports

telephone terminals

ASCII VDUs

colour VDUs

graphics VDUs

viewdata terminals

voice, input/output

workstations

cases

integrated circuits

keyboards

memory

passive devices

peripheral controllers

printer mechanisms

recording heads

screens

bar code readers & printers

digitisers

disc drives

floppy disc drives

Winchesters

graphics/handwriting tablets

optical character recognition

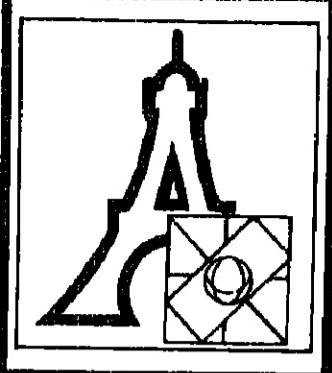
paper tape readers/punches

plotters

point-of-sale

colour printers

bureaux

IFIP REPORT

IFIP '83 almost erupted into a slanging match on its final day. A discussion on formal development methods, at last week's ninth world computer congress in Paris, revealed a passion not associated with technical debates. A panel of five experts on formal methods, including an advisor to Japan's fifth generation project and a leading guru from Xerox's Palo Alto Research Centre, were accused of "laziness, stupidity, or both" by a fiery Polish professor. He lamented that we are still at the starting block in developing for-

mal methods.

Formal methods, dataflow design, VLSI architecture, logic programming, networks and communications, logic programming, database design and the social implications of computers made up just a few of the over 100 sessions attended by the more than 2,000 delegates at IFIP '83.

The conference, held once every three years, brings together an intimidating array of university boffins and research and development people from deep in the bowels of the world's computer companies to exchange ideas.

Full compatibility is closer

by John Riley
WORLDWIDE compatible computer communications took another stride towards reality last week, when standards bodies ISO and CCITT announced the extent of their collaboration. As a result, both bodies are bracing themselves for increased opposition.

Over the past five years both ISO (International Standards Organisation) and CCITT (Consultative Committee of International Telephone and Telegraph) have been working increasingly closely to draw up the seven layer open systems interconnection model (OSI).

Professor Tohru Moto-Oka, of

Tokyo University, and chairman of the Founding Committee of Japan's Fifth Generation Project, warned that both were of virtually single minds now and outlined the future programme.

He foresees problems ahead within the industry and from academic circles: "I realise that it is frustrating for engineers to take part in the standardisation programme. Standardisation means reducing freedom to do things as you'd like, and when working towards a collective design, I agree that some compromise is necessary."

Steel said: "OSI is a human construct, and is a rational way to

work. Whether it is perfect or not isn't the issue. The question is whether it is workable and acceptable to the vast majority to accomplish what they want to do.

"People using the system should be able to use a different system quite independent of the physical nature of the boxes, either hard or software."

The programme is moving ahead rapidly with the basic reference model, IS 7498, carried, good progress reported for the transport layer standards, and the session layer standard is expected to be upgraded from a draft proposal to a draft international standard.



AMDAHL . . . Using "new" methods.

Amdahl is talking about his chip

GENE Amdahl confirmed that he is talking to most of the major computer manufacturers about licensing of his radical new chip design for large computers. With licensing agreements with Sperry, DEC, and Compagnie Machines Bull under his belt, further deals can be expected in the near future.

If big machines drive technological advance in computers, Gene Amdahl is the man to listen to.

And Gene Amdahl's address to IFIP's Ninth World Computer Congress had the larger of the conference halls at Paris' Palais des Congrès packed to its wings. Amdahl, who designed the IBM 360,

was coy about giving further details of the machine which will emerge from his new company, Trilogy.

But he said enough to whet the appetite of at least one IBM researcher and development man, who probed for further details on the Trilogy chip design.

Amdahl confirmed that he is pressing ahead with his plan to publicise Trilogy in mid-October. He was off to meet potential European investors in Trilogy soon as he finished his address.

Amdahl said the design architec-

ture for the Trilogy machine is completed, and was now undergoing simulation. Wafer scale integration has been built, and it works, he said. Speeds will be 20% faster than the fastest commercial scale systems now available, he promised.

Amdahl said the new system would be ultra reliable, with 600 years of meantime between failure of chips, and a four year meantime failure for the computer system, excluding peripherals.

The problem with the chilled water cooled system is not cooling, but the amount of power taken in and out, he said.

The architecture of the system is entirely new, with deep pipelining to a maximum of 64 instructions.

Amdahl is sticking with mid-

1985 as the date for first delivery of the system, in spite of many doubts. He promised a price performance below that which any of the plug compatible manufacturers could offer, and below that of IBM's promised new machine, the Sierra.

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But 32-bit microprocessors will not be generally popular for some time, Intel's own 32-bit 486 was very slow, he said, going in for functionality, not speed.

Moore believes the ability to build more complex structures will continue as in the past. Silicon, he thinks, will continue to be the most widely used material, because of its wide availability compared with sub-

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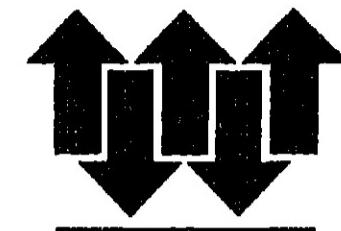
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COMPUTER TRADE FORUM

AUTUMN
COMPUTER
TRADE
FORUM 1983



National Exhibition Centre
Birmingham 4-7 October

Computer sales in UK rise faster than expected

John Aczel reports a dramatic growth in the market for systems and peripherals, despite a slackening off in other industries

SALES of computer systems and peripheral equipment in the UK have sped up and overall demand has grown faster than expected. The latest statistics indicate buoyancy in the computer sector and this is likely to be well maintained during the next 12 months.

Over the past year, demand for hardware has expanded markedly and in 1982 it is estimated that sales have totalled £1,500 million at manufacturers' prices. This does not include wholesale and retail margins, and the value of the market was much higher when all distribution costs are taken into account.

Growth of the market in 1982

has been quite pronounced, despite the slack conditions in British industry as a whole. The overall growth in demand has averaged 15 per cent, but this has varied considerably according to the product groups concerned. Allowing for inflation, the real growth has been at least 10% after taking into consideration increases in retail prices. This is probably an underestimate as costs of many computer products have been falling sharply and the volume of demand has grown much faster for a number of products, particularly for disc storage units and printers.

Exports to the EEC countries have moved ahead markedly. Sales to France reached £13 million for processing units, while to Germany they amounted to £18 million.

According to the latest figures,

Foreign suppliers of computer systems are now presenting a strong challenge to British-based firms and at the beginning of 1983 they accounted for 80% of the total sales within the UK market. This proportion has been rising and could continue to go up despite the strength of the dollar, which is forecast to continue in the coming months.

Demand for peripheral equipment has grown even faster than for computer systems, and in 1982 the size of the market for add-on equipment amounted to around £950 million. This was up by 18% compared to the previous year, with a particularly fast growth being shown for printers and storage units.

According to the latest figures,

There is little doubt, however, that the computer sector has been one of the most dynamic areas in the British economy. During 1982, gross domestic product increased by only 1% and, in most parts of the British economy, demand has been slack. Thus, the computer sector has had a truly outstanding performance, and this expansion is likely to be surpassed by a wide margin during 1983.

Though a number of estimates have been made about the size of the market for both computer systems and peripherals, the official statistics contain many gaps and their information is not fully comprehensive. Only the bigger companies take part in the survey carried out by the government and, according to the official estimates, about 90% of establishments are included in the investigation. Some of the figures are subject to considerable revision, and any statistics given at this stage have to be treated with considerable care because of this.

Overall statistics about the size of the market are not available and various ways have been used to assess this trend in the computer sector. One of the best methods is to take the production figures and adjust them by exports and imports to get some idea of sales. But, this is a crude method and does not allow for a number of factors, particularly changes in stocks.

In addition, the price levels may be somewhat confusing, though in most cases they are at manufacturers' prices. To make allowances for distribution margins, particularly for wholesale and retail costs, is impossible, as they vary considerably according to the product.

Total sales of computer systems have been expanding in 1982 and it is believed they amount to around £560 million which was a growth of 10% compared to 1981. The underlying trend for computer systems has been very strong, particularly from the US.

Deliveries by the US accounted for over 30% of the total in terms of processing units and complete systems, and for the first three months of the year they were valued at nearly £50 million for CPUs on their own. Imports of CPUs from West Germany have also been at a high level, totalling £13 million in the first three months of 1983, while significant sales have come from suppliers from Denmark, France and the

however, expansion has been even more rapid during the first three months of 1983. Total sales amounted to £285 million at manufacturers' prices and were up by 30% compared with the same quarter in 1982. Growth has been higher than expected, and by volume, this rise has been even sharper, in view of the fall in price in many peripheral items.

The fairly low level of sterling has made exporting easier, though competition has been quite fierce in many overseas markets. Thus output reached £183 million in the first quarter of 1983 which was a gain of 14% compared with the first quarter of 1982. Last year, output for peripherals moved up relatively slowly at 6% and amounted to £678 million. Clearly, production has not kept in line with overall sales, and the differential has been made up by the substantial increase in imports for peripherals.

In 1982, total imports of peripherals rose by over 30% to nearly £720 million.

British imports of disc storage units in the first three months of 1983 amounted to £53 million and the value of imported printers was estimated at £1,500 million at manufacturers' prices. A growth of around 30% is quite possible for this year and overall demand could reach about £2,000 million in 1983. Naturally, these are only tentative estimates, but they highlight the strong growth likely to occur in the computer sector during 1983 and which will be well maintained in the coming year.

Competition in the peripheral market has been intense and the US has maintained a strong lead. Its sales reached £115 million in the first three months of 1983, but a major challenge has been seen from some of the Far Eastern producers, particularly Japan. Japanese sales of peripherals continued to make strong progress and amounted to £16 million.

For some product groups, im-

ports have come down significantly and, in the case of printers, dropped by about 50% in imported prices. Evidently some foreign manufacturers have been willing to cut their prices sharply in order to keep their volume at a satisfactory level during this period.

Exports of peripherals have also performed well and amounted to £40 million in 1982. This was an increase of 20% compared with the previous year, while for the first three months of the current year, sales from overseas markets have gone up by around 15% to £16 million.

British exports have been concentrated in certain areas and have performed particularly well with VDUs. Their value went up to £40 million in the first three months of 1983, while a useful increase has also been seen for disc storage units, with their value amounting to £19 million in the first three months of the current year.

It is estimated that over 130,000 peripheral units were sold abroad and the average price has been coming down sharply.

Several bullish factors are likely to influence demand for computer systems and peripherals. For one thing, the general economy in the UK is showing signs of picking up, even though the process may be relatively slow. For instance, the growth in gross domestic product could average 2.5% this year, following a minimal rate of increase in 1982. Interest rates are now fairly stable and lower than they have been in previous years. This is important as it should enable companies to install new computer systems at lower interest charges.

In addition, the profitability in industry is improving and the cashflow of many firms is showing signs of picking up. Thus there will be more resources available for commitment to new computer systems as well as to extending existing ones.

As a result capital expenditure, which has been at a fairly low level over the past few years, is improving and, according to the latest forecasts, total investments will increase by at least 5% in real terms. Naturally, computer installations only represent a small proportion of overall capital expenditure, but above average outlay on computers is expected in the financial sector, the service industries and the oil sector.

In addition, prices of computer systems and peripherals are coming down sharply and this is opening up the market considerably.

During 1982, the market for computer systems and peripherals was estimated at £1,500 million at manufacturers' prices. A growth of around 30% is quite possible for this year and overall demand could reach about £2,000 million in 1983. Naturally, these are only tentative estimates, but they highlight the strong growth likely to occur in the computer sector during 1983 and which will be well maintained in the coming year.

On present trends, an above average growth rate will be seen in the peripheral sector and sales of certain items will increase rapidly. In particular, demand for efficient and cheaper printers as well as for high capacity storage units is likely to be at a high level. Competition in these fields, however, will be main factor.

TABLE 1: PRODUCTION OF COMPUTER SYSTEMS IN UK (including central processing units)

	£m
First quarter 1981	93.5
Second quarter 1981	87.0
Third quarter 1981	80.1
Fourth quarter 1981	91.1
First quarter 1982	102.0
Second quarter 1982	84.1
Third quarter 1982	104.0
Fourth quarter 1982	95.0
First quarter 1983	123.8

TABLE 2: EXPORTS AND IMPORTS OF ELECTRONIC COMPUTER SYSTEMS (by value)

	Exports £m	Imports £m
Fourth quarter 1981	80.3	112.7
First quarter 1982	68.8	105.3
Second quarter 1982	71.5	114.1
Third quarter 1982	69.2	114.6
Fourth quarter 1982	92.1	142.5
First quarter 1983	87.3	156.9

TABLE 3: SALES OF ELECTRONIC COMPUTER SYSTEMS IN UK (including central processing units) - BY VALUE (£m)

	First quarter 1983	Fourth quarter 1982	First quarter 1982
Production	123.8	95.0	102.0
Exports	87.3	92.1	68.8
Imports	156.9	142.5	105.3
Sales	193.4	145.4	138.5

TABLE 4: PRODUCTION OF PERIPHERAL EQUIPMENT IN UK

	First quarter 1983	Fourth quarter 1982	First quarter 1982
Storage units	20.1	17.8	18.5
Input/output units	100.5	110.2	92.2
Other units		60.7	45.6
Other offline data equipment	62.9*	5.3	3.8
Total	183.5	194.0	161.1

*Estimated

TABLE 5: TREND IN PRODUCTION OF STORAGE UNITS

	Index	£m	First quarter	1981=100
First quarter 1981	20.0	100.0		
Second quarter 1981	16.4	82.0		
Third quarter 1981	15.8	75.0		
Fourth quarter 1981	19.2	96.0		
First quarter 1982	18.5	92.5		
Second quarter 1982	16.1	80.5		
Third quarter 1982	23.0	115.0		
Fourth quarter 1982	17.8	89.0		
First quarter 1983	20.1	100.5		

TABLE 6: TREND IN PRODUCTION OF INPUT/OUTPUT UNITS

	Index	£m	First quarter	1981=100
First quarter 1981	86.9	100.0		
Second quarter 1981	87.3	100.5		
Third quarter 1981	84.5	97.2		
Fourth quarter 1981	110.8	127.5		
First quarter 1982	93.2	107.2		
Second quarter 1982	93.5	107.6		
Third quarter 1982	103.9	119.6		
Fourth quarter 1982	110.2	126.8		
First quarter 1983	100.5	115.6		

TABLE 7: IMPORTS OF PERIPHERAL EQUIPMENT IN UK

	First quarter 1983	Fourth quarter 1982	First quarter 1982
Storage units	86.9	100.0	
Input/output units	213.5	193.9	157.0
Other units		0.4	
Punchers, verifiers & calculators	0.1	0.1	0.2
Other offline data equipment	3.1	2.6	1.6
Total	217.7	196.6	160.8

TABLE 8: EXPORTS OF PERIPHERAL EQUIPMENT IN UK

	First quarter 1983	Fourth quarter 1982
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PRODUCTS

Add Retro-Graphics to DEC's terminals

DEC VT100-Series video terminals, including the VT100 and VT102, can be upgraded to emulate Tektronix 401/4014 graphics terminals with the addition of new DQ640-series Retro-Graphics terminal enhancements, manufactured by Digital Engineering.

Offered for \$970 to \$1,195 list price, DQ640-series models are printed-circuit card and CRT assemblies that install in DEC terminals, provide Tek 4010/4014 graphic features, and compatibility with programs written for Digital Engineering's VT640-series Retro-Graphics for DEC displays.

DQ640-series is available in 800-by-480 or 800-by-240 bit-map resolution.

With more than 25,000 installed, the widespread use of Retro-Graphics has prompted the

Digital Engineering (CW), 630 Berke Drive, Sacramento, CA 95814.

Single mass memory for 12 terminals

A COMPACT 5½-inch Winchester disc unit with 18 or 36 Mbytes capacity now available for Commodore machines can provide simultaneous mass memory for up to 12 terminals.

The hard disc unit is marketed by IMI Computing.

Commodore Basic 4, DOS 2.5 and IEEE488 compatibility mean that programs written for CBM 8000 series can be used almost without modification. In addition up to 40 relative files can be opened at the same time.

IMI Computing (CW), PO Box 784, Witten, Birmingham B6 7BA. Tel: (021) 356 4848.

Low-level monitoring system for £20,000

THE PMS Starter Package, a complete working production monitoring system, including hardware and applications software, from General Automation, is priced at under £20,000. GA plans to capture that part of the manufacturing industry which has been deterred from introducing computerised monitoring systems on the basis of cost, and encourage the speedier introduction of pilot schemes in the larger concern.

The PMS Starter Package is based on a GA Boss 20 16-bit



The Viewpoint/Color VDU.

Low-cost drum plotter for mini or micro users

THE low cost DMP-42 drum plotter from Houston Instrument, launched in the UK by Sintrom Electronics, is suited for use with any micro or minicomputer to produce drawings for engineering, CAD/CAM, building and surveying and scientific research and development applications.

The price, £2,360, is claimed to be the lowest for an A1/A2 plotter on today's market.

The DMP-42 can be used to plot complex plots such as topographic maps, weather charts and piping layouts for chemical plants. It will plot on 16.5x23.4 inches and 23.4x33.1 inches media, as well as on architectural 24x36 inch media.

Aspect control is provided in which one or both axes of the character may be varied, and the ability to draw only a portion of a plot and to scale drawings up or down is also resident in the ROM.

The DMP-42 is supplied with an adjustable floor stand which allows the plotter to be placed at desk height for ease of use. Bond, vellum, clear film or synthetic plotting media are precisely registered under the moving pen by a

domestic DEC Field Service Organisation to offer both on-site and depot maintenance/service programs for Retro-Graphics terminated DEC terminals.

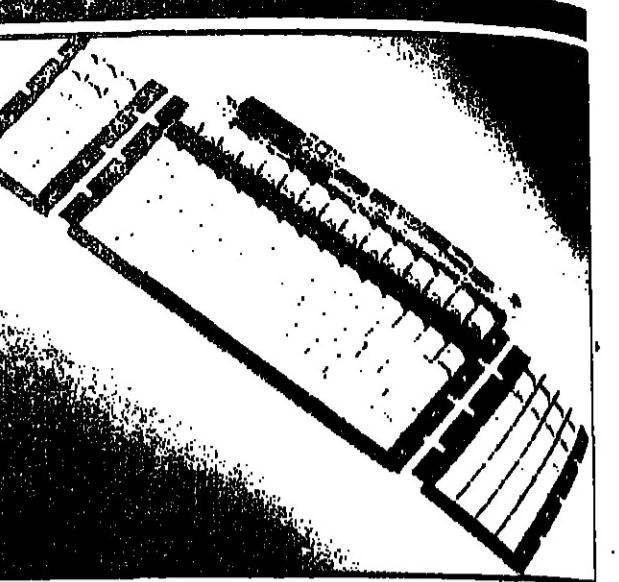
Because it is 4010/4014-based, Retro-Graphics can be used to draw dot/dash/solid vectors, plot points, and transmit X-Y co-ordinates with a crosshair cursor. Additionally, 800-by-480 resolution model can be utilised for displaying all four Tektronix 4014 graphic features, and compatibility with programs written for Digital Engineering's VT640-series Retro-Graphics for DEC displays.

DQ640-series is available in 800-by-480 or 800-by-240 bit-map resolution.

With more than 25,000 installed, the widespread use of Retro-Graphics has prompted the

Digital Engineering (CW), 630 Berke Drive, Sacramento, CA 95814.

The DMP-42 drum plotter from Sintrom Electronics.



Multi-option keyboard from Cherry Electrical.

Multi-option keyboard offers 12 layouts

A NEW keyboard concept called the multi-option keyboard, designed to meet the demand for customised keyboards using off-the-shelf standard modules, is introduced by Cherry Electrical.

Cherry's marketing director, Robin Brewer, says this approach allows designers to obtain custom keyboards without incurring the heavy costs of a true custom design and aimed at low volume keyboard users who have difficulty obtaining a standard keyboard to fit their exact needs.

The multi-option keyboard comprises three main modules which may be mixed in various configurations to provide 12 possible layout options, including qwerty, and qwerty plus special functions combined with either or both 3x7 or 4x7 keypad clusters which can be located at either side of the keyboard in various configurations.

In addition, the parallel port can be tri-state under control while up to eight rates can be controlled remotely.

Cherry Electrical Products (CW), Coltharbour Lane, Bordon, Herts AL5 4UN. Tel: (05827) 63100.

The modules interconnect both mechanically and electrically and there is also a sophisticated

electronics package offering such as a choice of auto-repeat, parallel or serial input in TTL or RS232 compatible format with a choice of dual-mats.

The multi-option keyboard is Cherry's latest generation keyboard with a choice of flat or sculptured keys. Its keyboard will also be made shortly with low profile capsule keyswitches.

The qwerty module offers 61 keyswitches including a flat-shaped key and a further 15 function keys, eight of which are illuminated. These keyswitches can be populated or depopulated to meet the user's exact requirements.

In addition, the parallel port can be tri-state under control while up to eight rates can be controlled remotely.

Cherry Electrical Products (CW), Coltharbour Lane, Bordon, Herts AL5 4UN. Tel: (05827) 63100.

The modules interconnect both mechanically and electrically and there is also a sophisticated

A record of what is being sold—and when

A NEW point-of-sale data collection terminal, the QS5500, from Quality Systems International, offers a sales, stock movement and administrative record.

While the system is primarily designed to provide management information, the terminal looks like a conventional cash register, and "leads" the operator through sequences for all transactions.

This is achieved through the terminal's 40 character alphanumeric display, each side of which can function independently of the other, so that for the customer, selected information or a message can be given.

All transactions are printed on an integral high speed 80-column printer, the same data held on the terminal's memory.

Quality Systems International (CW), Imperial House, 102 High Street, Leicester LE1 1NA. Tel: (0533) 543553.

To help speed transactions the credit card reader is motorised. It can also detect "hot" cards.

A data well, integral in the terminal, automatically records all details from a cordless bar code wand.

As a management information system, using magnetic data cartridges and non-volatile bubble memory, it records what is being sold, when, at what branches and how fast. It calculates, prints results and can show the information on its alphanumeric display; and it records branch level transactions, staff performance and can be coded to identify both operator and sales assistant, should the two

be liked to the production line.

The hardware also includes five machine status terminals (MSTs) with plant connection panel and power supply and a standard VDU.

General Automation (CW), Stirling House, 20 Station Road, Gerrards Cross, Bucks SL9 8EW. Tel: (0753) 889112.

The new point-of-sale terminal from Quality Systems International.

Colour VDU plug-compatible with monochrome systems

DATA DYNAMICS has announced the ADDs Viewpoint Color VDU which has plug compatibility with ADDs Regent 40/60 and ADDs Viewpoint 60 VDUs.

The low-glare screen can be rotated through 360 degrees and can be tilted over a 19 degree range to suit the individual operator. Apart from a 16-key "typewriter" style section there is a 14-key numeric cluster, a phosphor and displays the industry-standard 24 lines of 80 characters.

There is a choice of eight background and eight foreground colours which can be individually selected from a palette containing red, green, blue, yellow, cyan, magenta, white and black.

The standard interface is RS232C with a 110 or 19.2K baud rate, RS422 or 20mA current loop interfaces are available as options.

An auxiliary RS232 printer port can be adjusted independently in speed.

There are a number of data transmission and reception modes including the standard local, conversational and block modes;

plus message, form, job and monitor.

The VDU can be supplied with Data Dynamics' international language sets which includes changeable key tops to suit the language.

Data Dynamics (CW), House, Clayton Road, Middx. Tel: 01-845 9781.

The Viewpoint/Color VDU.

PRODUCTS

Telex links to word processor

A FACILITY which enables Puma telex terminals to be linked to word processors or computers is announced by Trend Communications.

A telex message can be typed directly into any word processor, computer or electronic typewriter with V24/RS232 communications interface. It can then be transmitted at up to 300 bits per second into the Puma's memory. Once it is in the memory, a telex operator can add the dialling information and send it over the telex network in the normal way.

Similarly, an incoming message

can be transferred from the Puma to the office system by a reversal of the above method. All ITA characters can be loaded into Puma, but only those with a direct ITA number 2 equivalent can be output to the telex network. An exception is that lower case letters are converted to uppercase.

The multi-option keyboard is Cherry's latest generation keyboard with a choice of flat or sculptured keys. Its keyboard will also be made shortly with low profile capsule keyswitches.

The originator of the telex is able to check the message at source, ensuring that the telex is sent out accurately, thus eliminating errors which might have been introduced through the telex operator re-typing it. This also allows the telex operator to carry out other duties.

The opening up of the communications market following the relaxation of BT's monopoly has allowed 3M to introduce this new development to the UK market.

The 3M Whisper Writer is a desktop communications terminal, no bigger than a small portable typewriter, with some innovative features.

It is quiet in operation, easier to use than the normal teletype terminal and considerably faster, says 3M. It will sit on an office desk but can easily be carried to almost any location.

It plugs in to a standard telephone jack or can share a line with an existing telephone.

A local workstation can be linked to the Puma over a distance of up to one kilometre. Originators of a message may be in departments spread around the organisation or even in a different building. By using the Puma workstation link, considerable time is saved by removing the need for sending the message by internal mail or hand carrying by the originator, says Trend.

The Whisper Writer is available in a number of configurations.

Units can incorporate either an integral V21 modem for direct connection to a telephone line or a standard V24/RS 232 interface for external connection to a hardwired or acoustic modem.

It is also available packaged in an executive case with an integral acoustic coupler enabling the terminal to deliver instant information from customers' offices, hotel rooms, or anywhere the user has access to a telephone and power. It can be used alone as a receive-only printer or the intelligent keyboard can be added for full communications capability.

The direct phone line connection provides automated answer and unattended receipt.

3M Business Products Division (CW) 3M House, PO Box 1, Bracknell, Berks. RG12 1JU. Tel: 0344 58473.

Non-glare display

LEAR Siegler's ADM11 display terminal is now available in the UK from Peripheral Hardware.

The unit offers Lear Siegler's Dumb Terminal functions, and costs £540, although dealer and systems house discounts are available.

The ADM11 has a non-glare, green display which tilts and swivels to suit the operator and office lighting. The separate keyboard, with sculptured keys, also tilts.

There are eight programmable functions, an auxiliary RS232 port for a dedicated printer, plus communications speeds of up to 19,200 bits a second.

Peripheral Hardware (CW), Unit 13, Monkspath Industrial Park, Highlands Road, Shirley, West Midlands B90 4NY. Tel: (021) 745 3033.

To help speed transactions the credit card reader is motorised. It can also detect "hot" cards.

A data well, integral in the terminal, automatically records all details from a cordless bar code wand.

As a management information system, using magnetic data cartridges and non-volatile bubble memory, it records what is being sold, when, at what branches and how fast. It calculates, prints results and can show the information on its alphanumeric display; and it records branch level transactions, staff performance and can be coded to identify both operator and sales assistant, should the two

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The hardware also includes five machine status terminals (MSTs) with plant connection panel and power supply and a standard VDU.

General Automation (CW), Stirling House, 20 Station Road, Gerrards Cross, Bucks SL9 8EW. Tel: (0753) 889112.

The Viewpoint/Color VDU.

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JOBS IN THE FINANCIAL SECTION

Midas touch for job-seekers

Plenty of good jobs wait to be filled, but finance companies are looking for the best says John Kavanagh

MONEY talks, so they say – and just now it is saying some attractive things to computing staff. For much of the finance industry – banks, building societies, insurance firms and other financial institutions – is going through a period of technological change which offers some rewarding challenges to ambitious people.

Add to this perks such as cheap mortgages, plus the demand from top consultancies for people with finance industry experience, and suddenly the idea of a job with a bank or building society does not seem so staid after all.

The finance business is now on exciting one to be in for computing people. Banks and building societies in particular have found themselves competing head-on in the last couple of years as banks have muscled in on the home loans market and building societies have started offering more current account facilities, including cheque books in some cases.

This battle has a big prize at the end: the general public's money.

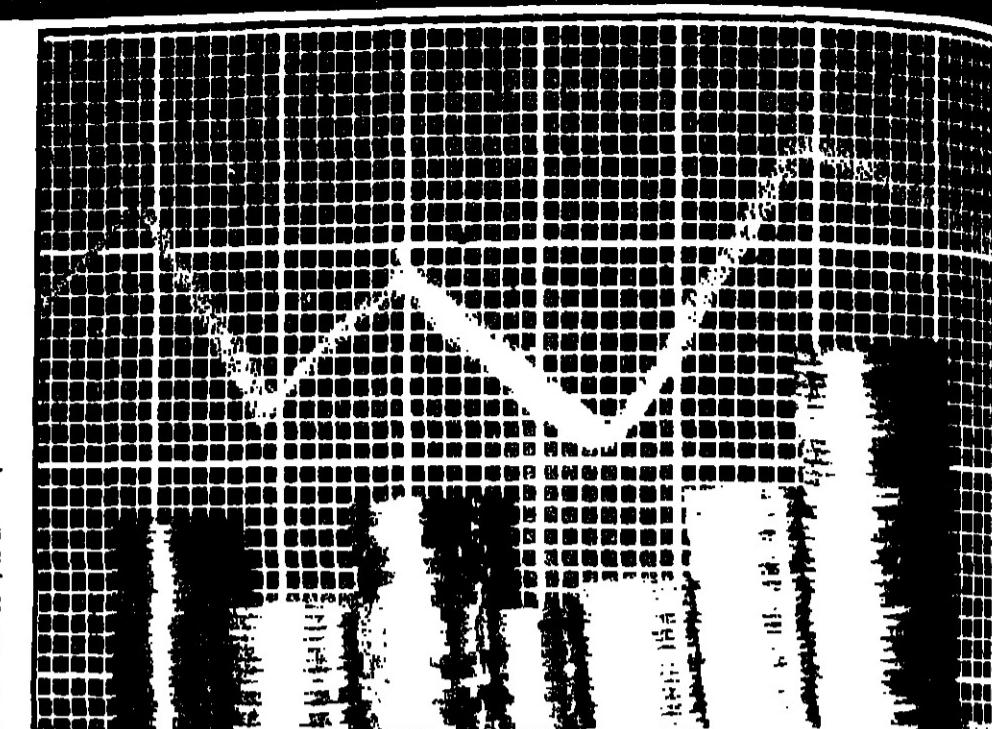
For the British are the great unbanked. About half the working population is still paid in cash, compared with 1% in the US, 2% in France and 5% in Germany.

Banks say companies can save £2 per employee by getting them to take monthly payments through a bank account instead of weekly cash pay packets.

The pay of half the people with jobs is quite a sum, and worth fighting for. And one of the main weapons the finance industry is using is high technology.

Building societies are considering installing self-service auto-teller machines to offer the same round-the-clock withdrawal facilities as banks, plus services such as cash deposits and enquiries through the same terminals.

These comments were borne out by two leading insurance firms, which preferred not to be named. Both were starting to look for staff



"The sky is the limit for the ambitious person in banking."

There are some big shake-ups going on. Some companies in the finance industry are looking for complete teams of people. One big US firm is recruiting 60 people, from data prep staff to systems analysts.

again this year after a recruitment freeze.

"We're expanding our DP development area because we have a long list of big things to do, especially in online systems," said one company.

Koning said there were plenty of good jobs around, but finance companies tended to want the best people.

"Once you're in banking or insurance and have got a good grounding it's easy to move around – but it can be difficult to get in if you're coming from the commercial world," he said.

One of the insurance companies

said it looked for at least two A-levels for programming jobs. Operators had to have five O-levels as an absolute minimum. The other company said it went mainly for graduates with at least A-level mathematics. It was looking for eight programmers this year and more than 12 analysts. Other perks included flexible hours and luncheon vouchers or canteens.

Koning at Targa added good salaries to this list. He said some companies gave mortgage subsidies as cash in hand. This could amount to between £1,500 and as much as £2,000.

He pointed out that perks such as these were not only an attraction for new staff – they were also a reason why established staff did not leave.

As he put it: "Banks and insurance companies and so on appreciate good staff and do it to keep them."

By no means all the jobs are commuting into London. Indeed the programmer, analyst, operator seeking a job in the finance world can choose beneath capital and any one of a number of pleasant parts of a country. Many companies in the industry moved their administrative and computing centre from London in the mid- and late Seventies. They were not constrained by a need to move to industrial centres, so they picked more choice spots in the country or on the coast.

"With some finance jobs

background you can go in any direction you want," said Koning.

"For example the top computer and management consultancies are crying out for people with banking experience."

So the message from the finance industry is that you have to go to get in.

Programming - with a difference.

At Hambro Life we have a refreshingly different view of what application programmers should be doing.

We think they should be more than just coders. We believe a strong technical Programming Department is essential for the design and implementation of the computer systems which are so central to the administration of our business.

As a result of this philosophy we are building an extremely strong and professional Programming Department which offers unlimited growth to programmers wishing to build technical careers.

Central to our applications software development is the use we make of IBM's database management system IMS - for example we have a network of logically related databases consisting of over 70 million segments. (Our IBM 3081 runs with 3380 discs using Xerox laser printers.)

But Programming at Hambro Life is also different because the company's different. Not content with its position as the country's largest unit-linked life company and one of the top 100 companies in the U.K., it is now embarking on a programme of

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All this activity means that we need more high-quality programmers to join our young professional team. We need people at a variety of levels, with salaries ranging from:

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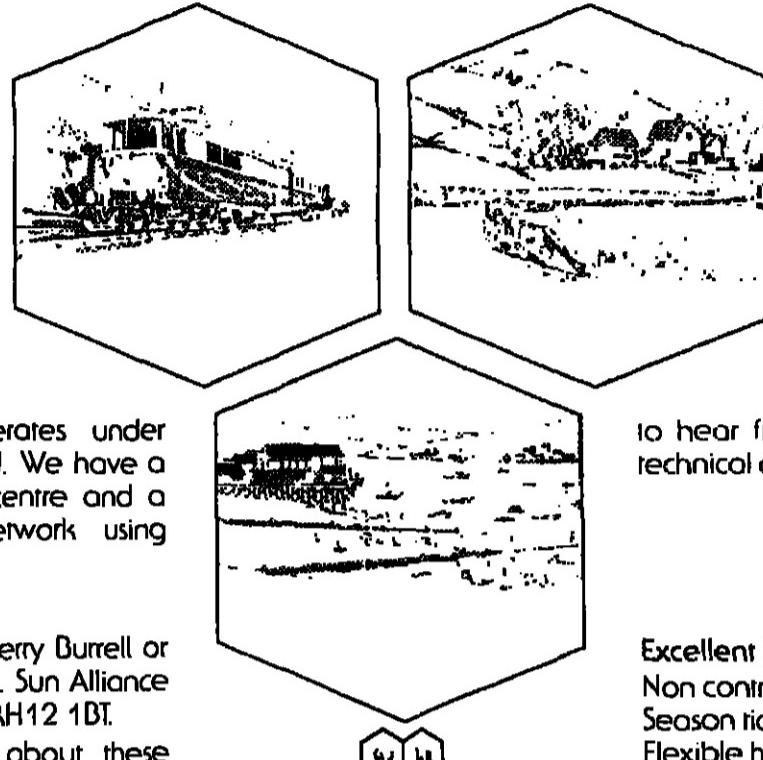
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Sun Alliance is one of the UK's leading insurance groups with sophisticated computing facilities occupying two linked computer centres. Our configuration which is already one of the largest and most sophisticated in Europe includes an IBM 3081 operating under MVS SP1.3 supporting an expanding 800+ terminal network using IMS as its DB/DC system. Program testing operates under VMCMS on a 16 megabyte IBM 3033U. We have a linked IBM 3032 at our Birmingham centre and a developing distributed processing network using multiple IBM 8100's.

ACTION

For an informal discussion, please ring Terry Burrell or John Quigly on Horsham (0403) 64141. Sun Alliance Insurance Group, North Street, Horsham RH12 1BT.

For a detailed information package about these appointments and an application form, please telephone the HAY-MSL Selection and Advertising Ansafone Service on 01-629 1844 at any time, quoting ref: QEU/146.



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(5695)



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We are actively involved in the implementation of sophisticated on-line systems operating at remote sites using terminals and IBM PC's for central and distributed systems. Group hardware is centred around the IBM 4341 under MVS and CICS and networking facilities form an integral part of our development plan.

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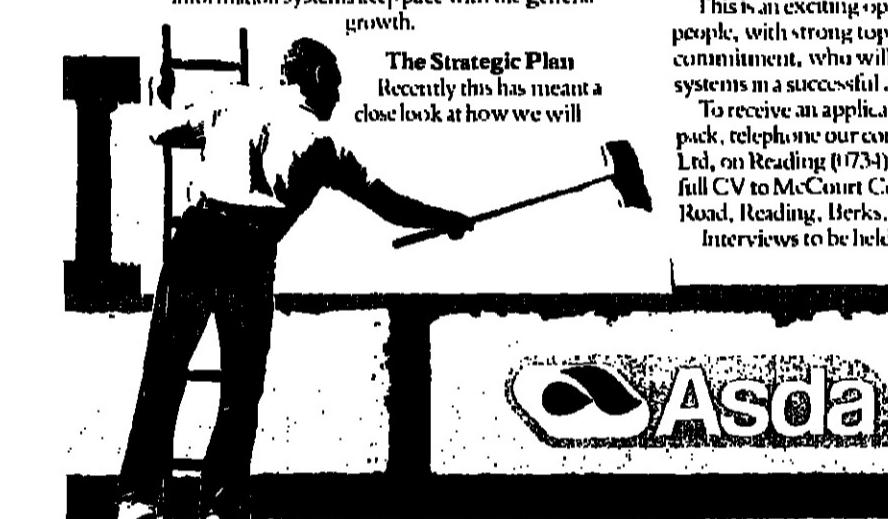
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Salary will be negotiable up to £14,000 and will be accompanied by a full range of benefits. Candidates who do not reach the required standard should, however, still apply as positions will be offered at lower levels. In all cases you should apply to David Mason Johns at KPG or on 01-747 0969 (evenings and weekends).

Systems Programmer

3M, a major international organisation with an expanding DP function, has an opening for a Systems Programmer to join their Technical Support Group at the company's Head Office in Bracknell. The current installation comprises two IBM 4341-2 and one BASF 773 operating under VM/DOS/VSE.

This is a challenging opportunity to become involved in the provision of a systems programming service to the company, and to assist in the implementation and evaluation of

computer equipment and software. The ideal candidate will be aged between 21-30, with a minimum of 2 years' programming experience, including 1 year 370 Assembler, and at least 6 months' systems programming experience.

To apply you should be educated to 'A' level, or preferably degree standard. Please write with full career details and current salary to Miss D. Archer, Personnel Officer, 3M United Kingdom PLC, 3M House, PO Box 1, Bracknell, Berkshire.

(5737)

**GERMANY & ITALY PROGRAMMERS**
IBM 43 XX, CICS, VASM, ASSEMBLER/COBOL
PERMANENT & CONTRACT
SALARY/FEES NEGOTIABLE+RELOCATION etc.

Our client is looking for permanent and contract Programmers for ON-LINE, CICS, ASSEMBLER/VSAM. Program development for Manufacturing and Accounting. APPLICATIONS: The vacancies are in West Germany and Italy and the client would be particularly interested in Nationals wishing to return home. They have an immediate 3/6 month requirement for a contractor in Germany.

For further information please write or telephone
PETER MERRICK

01-493 2947 (daytime) or 380 1640 (evenings)

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To find out more please phone John Jeffrey on (0223) 6220, or write enclosing your c.v. to:

CIS products
John Jeffrey
CIS (Products) LTD.
Quayside
Cambridge

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Expanding Recruitment Consultancy wish to recruit an additional consultant. Applicants should have the background of either DP, Sales or Recruitment.

In return we can offer a good basic salary and excellent commission scheme, with a friendly and professional office environment.

If you are self motivated and would enjoy working under your own initiative.

Please telephone for further details
01-242 1191

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KPG Computer Support Services Limited
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THORN EMI Micrologic, one of the leading British manufacturers of Electronic Point-of-Sale systems, has just announced the new TEM 2000 range of products. Aimed at general purpose applications in multiple high street retailing the TEM 2000 range consists of four POS terminal systems and a set of modular software packages. THORN EMI Micrologic is part of the THORN EMI Group, a major UK company with worldwide interests and very significant experience of retailing and information technology. Based in a low-cost housing area near the Beds/Combs border, with excellent road and rail links to London, this rapidly growing organisation is looking for men and women with the ability and drive to grow with them.

Immediate opportunities exist for:

Customer Service Engineers (TEM 2000 range)

Responsible for producing specifications and providing technical support to the Marketing Department, the successful applicant will have a formal qualification, be articulate and have project control and systems analysis experience. Knowledge of microcomputer systems and/or retailing would be advantageous.

Software Developers (TEM 2000 range)

At least three years' real-time programming in Assembler or high level languages is required, plus experience of estimating and planning tasks through to systems test and implementation. Candidates are likely to have a tertiary qualification and be effective communicators.

System Operators (TEM 2000 range)

To work within the product teams. Aged up to 30, with either a degree or very relevant experience, including two-three years' real-time programming at the assembler or application level - ideally RTL2 or Assembler and Pascal on Motorola 6809.

Isobel Bruce or David Futch on 01-405 1006 or write quoting Ref. No. MZ909, to Computer Professionals, 16 Red Lion Square, London WC1R 4OS

Technical problems requiring professional answers...

As one of the world's largest Money Brokers, being part of an International Group of Companies, our client is responsible for providing a complete DP service to group companies in London, Europe and the Far East. Group activities extend to Stock Broking, Bullion Broking, Financial Futures and Leasing, so efficient computer facilities are essential.

Continued expansion has created openings within their Systems Development Department in the City which houses an IBM Systems 38, IBM PC's and other Micros, from where they also support System 34 installations at group companies worldwide. Their development team is small but consists of technically competent, adaptable professionals who enjoy the challenge of their environment.

RPG PROGRAMMERS £9-12K

Two bright RPG programmers are sought to join a young team designing and developing a variety of business systems. The projects are interesting being of a financial nature and current developments include such systems as leasing, accounting and money trading. You will need good RPG programming skills with IBM System 34/38 experience, although full RPG III training will be given if required. Ideally you will be a graduate with 2/3 years experience.

Salaries are highly competitive and will be reviewed after 6 months. The benefits are attractive, including a non-contributory pension scheme, LV's and private family health insurance. If you feel you can meet the challenge of working in this technically stimulating environment...

Call Jane Emmanuel on 01-734 9723 during weekdays or 01-467 2828 evenings/weekends.

MICRO ANALYST/PROGRAMMER £9-12K

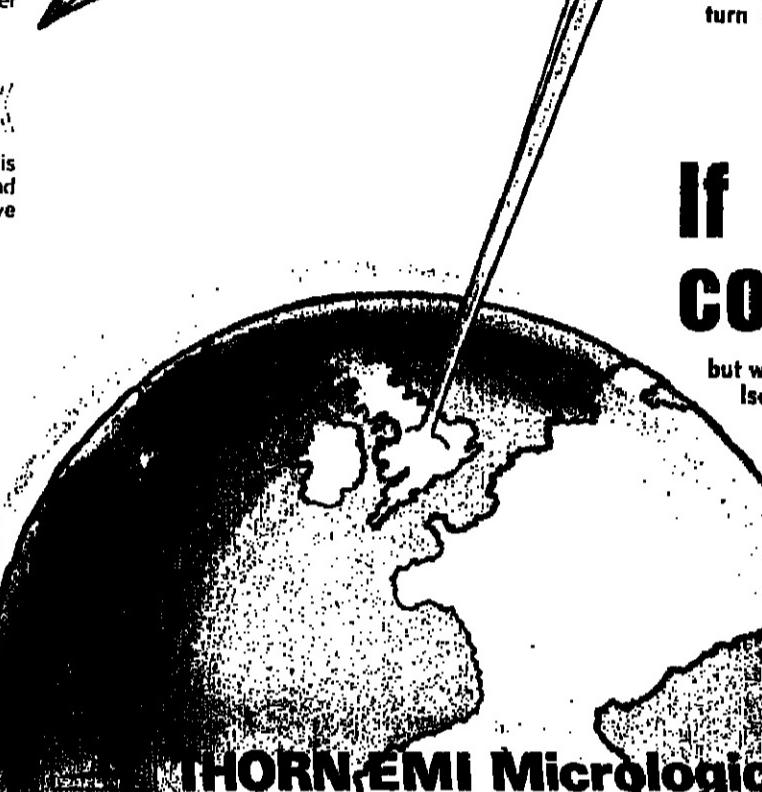
This is a new position created to expand the use of micro based systems within the Group. If you have a good overall knowledge of micros including programming and design, this is an excellent opportunity to become their micro expert. You will be responsible for keeping track of developments within the micro market place and advising how these could be beneficial to the Group, but in addition you will apply your skills to developing a diverse range of commercial and financial systems for worldwide use. Ideally you will be a graduate with enthusiasm and motivation to develop this excellent career opportunity.

CTR
Computer Technology Recruitment Limited, Triumph House, 189 Regent Street, London W1R 7WD.

between 4.30 and 8.30 p.m. on Wednesday 5th or Thursday 6th October at our offices (two minutes from Holborn tube station) for an informal chat about the opportunities available with representatives of THORN EMI Micrologic and something to eat and drink. A telephone call on 01-405 1006 to let us know you are coming would be appreciated or alternatively just turn up on the night.

If you cannot come...

but would like to be considered, please contact Isobel Bruce or David Futch on 01-405 1006 (office hours), or Isobel Bruce on 01-520 5733 (evenings/weekends). Alternatively write to us including a telephone number where we can contact you.



HORN-EMI Micrologic

(5600)

NEW WITH THE COMPUTER CENTRE

IBM 3083 – MVS/JES2, TSO/SPF, CICS and IDMS

Our client is a major international organisation operating in the Financial Information Services sector of the market on a worldwide basis, and is currently setting up a new centralised European computer centre. Decisions have been taken to develop a wide range of financial services for UK and European customers which involves the design and implementation of large DATABASE systems using IDMS and CICS as a TP monitor.

Immediate requirements are to recruit a number of key D.P. Professionals which will provide them with the scope and opportunity to make a significant contribution to the development of new major batch and online/realtime projects. Excellent career progression will be afforded to those D.P. Professionals who can demonstrate their skills and contribute towards these ambitious development plans.

PROJECT LEADERS

c.£15,000+
Applicants must be able to demonstrate a sound technical track record of design and implementation of large-scale batch and online database applications, with experience of IDMS or other database experience. A working knowledge of command level CICS is essential for one of the positions preferably gained in an OS/MVS/JES database environment. A knowledge of BAL would be an advantage, but not essential. Project Leaders are responsible for functioning systems and associated documentation.

DATABASE ANALYST

c.£14,000+
This position will suit someone with a sound knowledge of IDMS (IBM or ICL), together with a working knowledge of COBOL. The successful applicant, who will be responsible to the Database Administrator, must be able to communicate effectively at Project Manager level, and make database design decisions. Additional functions would eventually include responsibilities for staff at junior level.

If you are attracted to the challenge of these ambitious development plans, which provide the scope and opportunity for excellent career progression and generous benefits package, call IAN C. BUICK, MCBS, Managing Director.

BUICK COMPUTER SERVICES

RECRUITMENT DIVISION
72 Rochester Row
Victoria · London SW1P 1JU

Tel: 01-834 0061 (24-hours)
Or call evenings and weekends
01-942 1178

PRODUCTION CONTROL MANAGER MIDDX. **to £20,000+Car**
Our client, a large financial organisation needs a Production Control Manager to take responsibility for all aspects of Operations Production functions for a new IBM 3083 site, running under MVS/JES, TSO/SPF, CICS and IDMS. The successful candidate will have proven management and technical skills, and be capable of handling the diverse operational requirements of this large new site. Excellent career prospects and benefits apply.
Ref: C1006

SYSTEMS SOFTWARE SUPPORT UK/ABROAD **£20,000+**
This International Software House needs highly motivated D.P. professionals for exciting new customer support projects at home and abroad. Applicants must have thorough systems programming experience offering an excellent remuneration package together with outstanding career progression. The company is Ref: A860

PROJECT MANAGER LONDON **£18,000+ Profit Share**
A leading Software House needs someone with a sound knowledge of telecommunications and/or defence implementation of medium sized projects for private development. An O.R. background would be useful. BUPA, Life Assurance and Profit Share are just some of the attractive benefits offered.
Ref: D452

D.B. ANALYST X2 MIDDX/LONDON **to £15,000+**
Two large financial organisations require Database Analysts with a sound knowledge of IDMS and COBOL (ICL). Programmer, or Analyst. Excellent career prospects and benefits apply.
Ref: C884

PROGRAMMING MANAGER MIDDX **£14,000**
Supervising skills to lead a Programming team coupled with an in-depth working knowledge of COBOL (CICS/DLI) required for this leading manufacturing organisation. Excellent salary and company benefits.
Ref: B938

SENIOR ANALYST MIDDX **to £14,000**
This well-known company needs an Analyst to work within quality management and to provide technical support on proposal for TURNKEY projects using various machines. At least four years' experience in implementation of project systems is required. Exceptional working conditions, car allowance and free BUPA are just a few of the many attractive benefits available.
Ref: D820

PROJECT MANAGER HERTS **to £14,500**
At least seven years' appropriate computer experience, preferably with a knowledge of BURROUGHS. Experience of large companies systems development, staff control and some programming knowledge is essential. Ref: DB92

BAL PROGRAMMER SYSTEMS ANALYST KENT **to £11,000+ to £13,000+**
Leading manufacturing company needs an IBM-ASSEMBLER Programmer to take part in the development of online systems using SHADOW. Knowledge of COBOL an advantage. The company is also seeking a Systems Analyst to take a leading role in the design and development of these applications. An IBM DOS/VSE, SHADOW environment. A knowledge of BAL and/or COBOL would be useful. Excellent benefits include N.C. Pension, subsidised lunches, and a complete range of sports facilities.
Ref: C1010

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72 Rochester Row
Victoria · London SW1P 1JU

The above vacancies are only a token selection taken from our current files, and we are always pleased to hear from computer professionals wishing to further their career objectives.

ANALYST/PROGRAMMERS

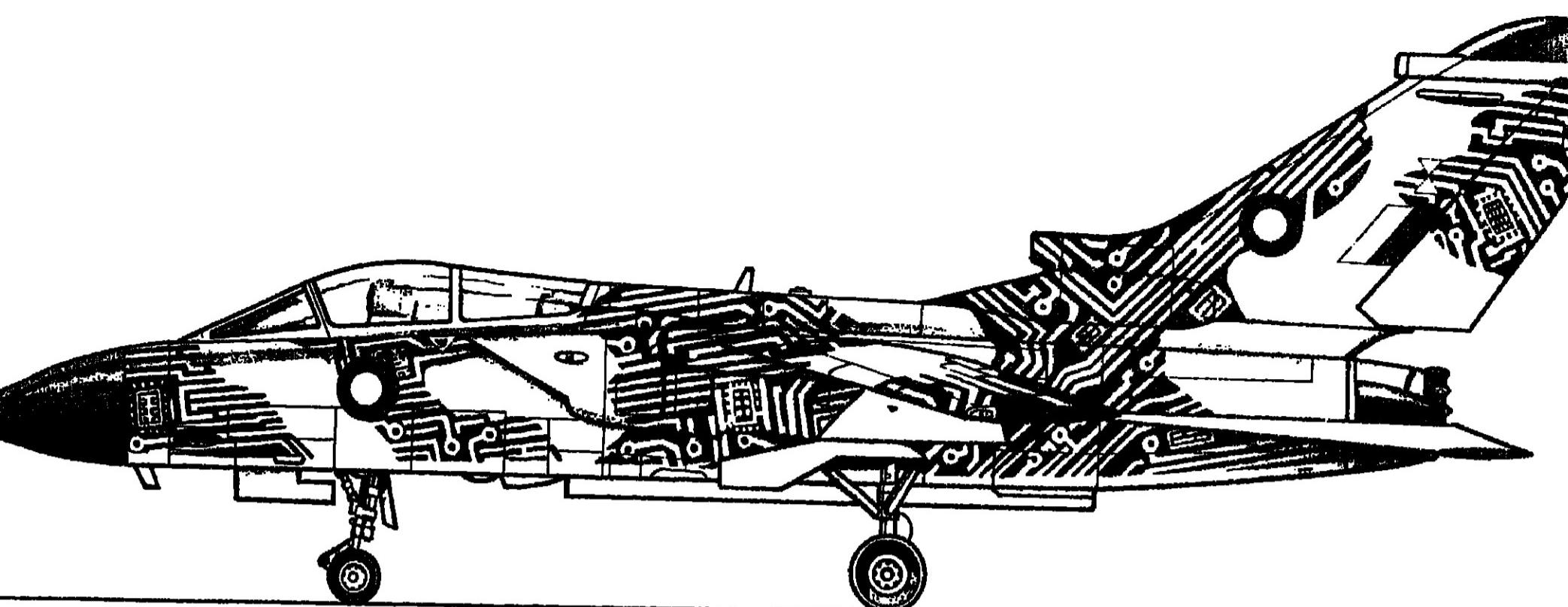
to £13,500+
Applicants must have sound experience of IBM COBOL, together with a working knowledge of JCL preferably gained in a large-scale online database environment using OS/MVS. Exposure to analysis at design and specification level is essential. A knowledge of BAL would be an advantage, but not essential. Training in CICS will be given where required.

PROGRAMMERS

to £12,500+
A minimum of 2-3 years IBM COBOL and/or BAL is needed, together with a working knowledge of JCL preferably gained in an OS/MVS environment. Training in CICS will be given where required.

OPERATIONS MANAGER

to £20,000+car
This position will suit someone with extensive DP expertise, together with a proven technical and managerial track record. The successful applicant will take a leading role in the pre-installation and running of this new Computer Centre.



Software Engineers for the world's most effective ECM systems

Control Software for the Sky Shadow active counter measures pod, arguably the most advanced ECM system to be used on operational strike aircraft to date, was developed by a specialist Electronic Warfare computing team at our Stanmore laboratories. The team is now moving on to new

Marconi
Space & Defence Systems

projects covering the next generation of integrated EW/ECM systems and requires additional permanent staff across a broad range of software engineering technologies, from embedded microprocessors through to VAX-11 super minis.

If you can demonstrate an ability to design and develop effective and highly reliable software, then a real career opportunity may exist for you in one of the following positions:

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Phone Jill Aplin on 01-954 2311 NOW, she'll tell you all about the work, the teams, our competitive salaries and benefits package and how you'll enhance your career by working with a company that's dedicated to technical excellence



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This is the background to our need for more D.P. Professionals to join our team and play a vital role in our continued success.

Specifically we would like to meet:

IMS DB AND/OR DC	Programmer/Analysts	Surrey
NOMAD	Programmer/Analysts	London
TANDEN	Programmers	London
ICL ME29	Programmer/Analyst	London/Essex
IBM S/34, RPG11	Analyst, Programmers	Scotland
D6 MV8000, DEGREE	Programmer/Analysts	Home Counties
VM OR MVS	Systems Programmer	London
HP3000	Programmer/Analysts	London
FORTRAN PDP11, RSX11	Programmer/Analyst	London
IBM PC	Finance Specialist	London
ICL EXPERIENCE	Analyst	London
ICL 2900, COBOL, TPMS	Programmers	London
SYSTEM 1240	Systems Engineers	N. London
MESSAGE SWITCHING		

Contract or permanent, we can offer you the range of positions and applications to broaden your technical expertise and enhance your career advancement into project management and beyond. We can also offer you excellent salaries plus the full range of benefits associated with a successful software house, including the opportunity to work on challenging projects throughout the UK, Europe, Middle East and possibly the USA.

Please contact:
TANGENT COMPUTER SERVICES LTD., FAIRFIELD HOUSE, FAIRFIELD ROAD,
BRENTWOOD, ESSEX CM14 4LR. TEL: BRENTWOOD (0277) 255755.

(5750)

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Banks and other financial institutions have many of today's most sophisticated communications systems. The most recent developments in information technology open up a whole new range of opportunities for new and enhanced systems in areas such as funds transfer. Logica's Finance Group is at the forefront of these developments. Due to expansion of this highly successful group, we are looking for additional talented people:

Systems Designers to c.£15,000
with more than four years' experience in the design and development of mini or mainframe TP/communications systems, on PDP, VAX, Tandem and IBM equipment.

Development Team Leaders to £13,000
with four years' experience in message switching, communications networks and EFT, or alternatively, good mini/micro real-time programming.

Programmers to £10,000
with at least two years' experience in real-time systems, ideally including message switching, communications networks and EFT.

To apply your knowledge in a market sector dependant on the latest technology, please call Jennifer Williams on 01-636 5454 or write to her at Logica Limited, 64 Newman Street, London W1; (quoting ref: FG/2).

logica

your appointments register

Programmers

NCR/IBM/COBOL	to £15K
Insurance - Banking	London - H. Counties - N. Eng.
COBOL/PL/I/OS/CICS/IMS	to £13K
Commercial	H. Counties - Midlands - Manchester
DEC/PDP 1170	to £11K
COBOL	Surrey
ASSEMBLER ON POPULAR MICROGS	to £35K + Royalties
Games Writers & Designers	London/Slough/Liverpool

IBM/MVS IMS/CICS/DL/1	to £15K
Middlesex	Middlesex

SYSTEMS 34/36/38/RPG2	to £12K
Insurance/Commercial	London/Home Counties

IBM System exp.	to £16K
Essex	Essex

BASIC Mini/Micro Computers	to £15K
London	London

IBM/UNIVAC/COBOL	to £12K
On-line/Database	Surrey

VAX & IBM SYSTEMS Fortran MVS/TSO	to £11K
South Yorks.	South Yorks.

Analyst/Progs

PRIME CAD/CAM	to £11K
Home Counties/E. Anglia	Home Counties/E. Anglia

IBM 34/38/4341	to £15K
London/Home Counties/North	London/Home Counties/North

ICL 1500/ME29/2903 COBOL	to £12½K
Essex/Herts	Essex/Herts

IMAGE PROCESSING C/UNIX Scientific Applications	to £12K
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Hardware/Support

APPLICATIONS ENGINEER	to £15K
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CUSTOMER SUPPORT Basic	£10K
Hampshire	Hampshire

SUPPORT ENGINEER VAX 780/760	to £17K
UK & Europe	UK & Europe

EXPD. SOFTWARE TECH. AUTHORS	£ NEG.
Datacomme/Operating Systems/Telephony/etc.	Europe

PROJECT ENGINEER Systems/DEC	to £11K
Beds/Manchester	Beds/Manchester

SOFTWARE SUPPORT Medical/Training/Technical	ENEG
Berkshire	Berkshire

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Senior Programmer
Surrey
to £12,000

Our client is a computer services company within a well-known group, which is currently expanding to take on more development work. Group benefits include a good pension scheme and profit sharing/productivity bonus. They have a variety of hardware, which includes IBM GSD equipment, DEC (PDP-11 and VAX) and micro-computers. Experience gained in a commercial environment (accounting, payroll, personnel records) manufacturing/production control, would be of particular interest. The systems to be developed will be both on-line and batch. In addition, you will be given the

IBM-GSD
• RPG II
• RPG III
• COBOL

opportunity to broaden your experience by implementing micro-based packages. As a senior programmer, you will already have had at least 3 years programming experience including, ideally some supervisory experience, as you will be responsible for the technical supervision of programmers. An additional requirement will be the ability to communicate with non-technical users. Please contact Joan Ainsworth on 01-681 8311 or write to her at Computer Search & Selection, 6th Floor, Carolyn House, Dingwall Road, Croydon, Surrey CR0 9XJ.

Systems Analysts

PERKIN ELMER On-Line/Database Systems	to £14K
Middlesex	Middlesex

CAD/CAM Real time - Modelling	to £16K
Mer/Essex/South West	Mer/Essex/South West

IBM/BURROUGHS Commercial Accountancy	to £15K
London/Surrey/Manchester	London/Surrey/Manchester

IBM/PL/I/DL/1 Database Support	to £11K
Middx.	Middx.

ICL/ME29 Commercial Design	to £16K
Herts	Herts

IBM SYSTEM 34/38 MAAPICS	to £13K
Sussex	Sussex

Software Engineers

CORAL/PASCAL/MASCOT/C Communications	to £13K
Glos/H. Counties/Midlands/Blackburn	Glos/H. Counties/Midlands/Blackburn

ASSEMBLER/PLM	to £12K
Northern England	Northern England

MILITARY SYSTEMS/RADAR	to £14K
Coral - Mascot	Hants/Surrey/Essex/S. Wess

PDP/VAX/INTEL	to £13K
Telecomms - ATE	Derby/Surrey/London/Kent

Computer Search & Selection

Analyst/Programmer c. £10,500 p.a.
Programmer c. £9,000 p.a.
ICL/ME29 COBOL
LOCATION: WORCESTER

The Company:
Dolphin Showers is an expanding company in the home improvements market. We are part of Kean & Scott Holdings Ltd. which includes Alpine Double Glazing Ltd. and Sharp Bedroom Designs Ltd. Kean & Scott is a member of the Hawley Group of Companies.

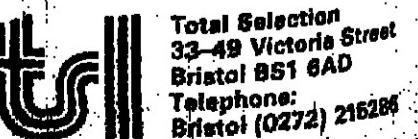
The Equipment:
ICL ME29 Model 37 currently running under MTS with Cobol.

The Requirement:
We are seeking to employ an analyst programmer and a programmer who will form the nucleus of a new data processing department, this function having previously been carried out at group headquarters. Experience of ICL/Cobol in an on-line transaction processing environment is considered essential. Ideally candidates should also have had some ME29 operating experience.

The Career:
The positions are demanding ones offering both the opportunity of being in at the start of a new department and considerable responsibility to the successful candidates. Several major development projects are in progress and we are committed to the introduction of data processing in most aspects of the Company's business.

The Rewards:
As well as highly competitive salaries we offer a range of excellent benefits including pension scheme, life assurance, discount on Group products and, if necessary, assistance with relocation expenses.

Interested? . . . Then please contact either Chris Morrow or Deborah Hallstone of Total Selection who have been retained to advise on this appointment.



Data Centre Manager
City
c. £15K+ car

Our client is a major subsidiary of a leading financial services organisation with a worldwide network of offices. The dramatic growth which has taken place in recent years has led to the installation of a large and very sophisticated multi-CPU mini computer system to handle the high volume of daily transactions. Plans have been approved to extend the use of data communications facilities and another powerful mini computer will be installed to handle a variety of other business activities. Application software development is handled by a Systems House.

Candidates must have in-depth experience of transaction processing installations and be sufficiently familiar with operating systems software to pin-point problem areas and to brief technical support personnel. Knowledge of the products of leading

mini manufacturers such as DEC, HP, TI, Honeywell or DG is important and familiarity with data communications equipment and techniques would be advantageous.

SALES EXECUTIVES

"The most gifted members of a group or community"

This is the Dictionary definition of Elite, and is exactly the type of Salesman we are wishing to attract on behalf of our Client. We wish to identify Salesmen who regularly achieve over quota performance and are capable of developing new business and are interested in participating in the "birth of a new product".

We are working on behalf of a major International Organisation, already tipped as a leading light in the industry and promising to be a real competitor for the

number one position. They are launching products in the UK in the next month and are looking for the elite to join a national salesforce. Specifically they wish to recruit in the Northern Home Counties, South East England, London, the Midlands, Manchester/Leeds and in Scotland.

You will be marketing a range of products that incorporates sophisticated architectural design and address the office automation area. Advanced communication protocols are

available enhancing the products marketability. You will be expected to demonstrate a successful track record of selling within the computer and office automation industry but more particularly, show the enthusiasm and drive necessary to penetrate major accounts where part of the success of this product will lie within your responsibility. With the anticipated growth our Client predicts excellent career opportunities for those candidates appointed at this early stage.



If you are interested and wish to know more, contact CATHY TRACEY on 021 236 1999 (24 hour answering service) or Henley in Arden 3273 (evenings and weekends)

Cathy Tracey & Associates Ltd

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13 NEWHALL STREET
BIRMINGHAM B3 3NH
TEL 021 236 1999 TELEX 825264

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TEL 0908 604848 TELEX 879264

Programmers CAD/CAM

Cambridge



We have been retained by one of the industry's most exciting and fast growing CAD/CAM companies to recruit for them a number of programmers to develop a sophisticated range of software products.

The company is committed to a continual programme of research and development in the area of CAD/CAM, particularly 3D Modelling Techniques, Numerically Controlled Machine Tools, sophisticated Database techniques and the broadening of applications from Mechanical and Electrical Engineering into other areas of industry.

They have, in-house, large Prime and Vax mini-computers dedicated to this development work and these are networked to a number of other machines within the organisation. A wide variety of Graphics Display Equipment is installed for the development of Graphics Software.

Applicants will be graduates and have a good working knowledge of Fortran, preferably gained on a VAX machine. Experience of Unix and 'C' would be an added advantage.

This is an unique opportunity to join a company whose success to date outstrips any of its nearest rivals.

Please contact David Hendry
CADsearch, London House,
271-273 King Street, London W6 9LZ,
Telephone: 01-741 8011.

CADsearch

We are Infogold, not widely known in the UK, but here in South Africa, we are something of a household name. Particularly as we are the Information Services Centre for the prestigious Gold and Uranium Division of Anglo American Corporation, and the importance of gold to South Africa is a well established fact. We are coming to the UK at the end of October to recruit a number of Computer Personnel to join our expanding Organisation. We work on a highly flexible approach to recruitment - if you would like to come to South Africa for a spell and have experience we could build upon, then we would be pleased to talk to you.

Our highly advanced IBM computer installation is centred on IBM 3033, 3081, 3083 hardware, and makes full use of MVS, IMS, ACF/VTAM, VSPC, TSO and much more. Here in South Africa we are widely regarded as one of the major computer installations in the country.

Our facilities are located at the heart of the gold fields, where the city of Welkom occupies a special place in the history of South Africa. The growth and development of Welkom over the years parallels the prominent role that gold has played in the economic growth of the country.

As you will see, we are looking for a wide range of personnel, and consequently we are prepared to be very flexible when considering applicants. Whilst our software requirements call for exposure to IBM software, training can be provided for those possessing basic ability.

The salaries we offer carry a high value in South Africa, and are enhanced by the provision of generous relocation assistance, bonuses and excellent sports, social and recreational facilities. South Africa has a lot to offer to families and individuals alike and an excellent standard of living is available within the country. Full assistance will be given with immigration and work permit procedures, thus enabling appointed candidates to travel to South Africa in a trouble-free manner.

As mentioned previously, we will consider applications on merit, so if your experience does not fill all of our requirements, but you feel that you have the necessary skills and experience to grow into any of the positions, then you should speak to our advisers at SCR to arrange an informative interview, telephone 01-236 3781 (24 hours a day, 7 days a week) or at home 01-236 3782 between 7 pm and 9 pm and 10 pm and 11 pm.

For further information, call 01-236 3782.

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North West

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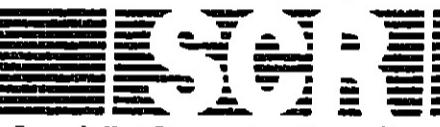
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IBM

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There are many new positions now available in Berkshire, West London and Middlesex for ambitious programmers wishing to increase their skills. My clients require 18 months + IBM COBOL under MVS or DOS/VSE in a commercial environment. You will be working in a development capacity, utilising CICS, DL/I or IDMS databases in the retail, manufacturing or transport industry. **REF. CW/4406**

ANALYST/PROGRAMMERS ESSEX £8-10,500

My clients, a highly respected manufacturing company are seeking a number of Analyst/Programmers to join a major development project. You will be involved in a sales and marketing system. Two years + IBM COBOL is essential preferably within a DOS/VSE, CICS or other on-line environment.

Full range of benefits associated with a major company including staff discounts. Training in CICS will be provided where applicable. **REF. EW/2337**

PROGRAMMERS

CITY £8-11,000

If you consider yourself to be above average COBOL Programmer with at least two years' experience, on an IBM mainframe with a knowledge of DOS/VSE, MVS or VM/CMS, coupled with CICS and/or DL/I, my client would be interested in knowing about you. They offer an excellent career path for self-motivated individuals with the opportunity to move into analysis if desired. Benefits and salary are those associated with a large City organisation. **REF. FW/3202**

ANALYST/PROGRAMMER CITY £11,000

An established international organisation based in the City have a number of superb Analyst/Programmer vacancies for up-and-coming D.P. professionals. You should either have a valid IBM COBOL background and have been involved in commercial work, or have a knowledge of design and/or graphics work. You will be working in an IBM 4341/3033 IMS/CICS environment for which training can be provided. Excellent career prospects. **REF. EW/2821**

OTHERS

ICL COBOL KENT To £11,000

Kent-based ICL 2960 installation is currently recruiting for ICL COBOL skills at various levels. 18 months + relevant experience, preferably with DME/GII is required for the programming positions. The more senior applicants will have proven systems experience and a solid COBOL background, and would be encouraged to move into analysis by writing their own specifications for interesting development projects mainly of a commercial nature. **REF. DW/2837/8**

HONEYWELL COBOL MIDDLESEX £8,500

12 months + Level 64 or 66 COBOL is required by this progressive Middlesex based company to join their development team. 11DS experience would be an advantage although not essential as this company believe in offering their staff a range of training facilities. You will be involved with a range of commercial applications from accounts to stock control systems. The company also offer sports and social club facilities and a subsidised restaurant in their package. **REF. DW/2482**

HEWLETT PACKARD ALL LEVELS To £14,000

My client is among the most successful in the Engineering field and due to expansion is looking to recruit two Analyst Programmers. The requirements are at least three years' FORTRAN and a sound knowledge of Prime. In addition some COBOL, BASIC or INFO experience would be welcome. This is a really superb opportunity to utilize your skills and step away from a straight Analyst Programmer job into a genuinely interesting position which will include Manager Support and the responsibility of making your own decisions and meeting a deadline. Positions are commercial in nature and personnel require, and the company is currently installing a new range of micro linked to the Prime. Authors will be sent foreign travel involved a fact in Europe. Language would be market. For further details of this position contact us now. **REF. MW/3821**

SYSTEMS DESIGNER MIDDLESEX £12,000+

This key position will appeal to a Systems Programmer who would welcome the opportunity to join in at the start of this company's exciting new project linked to the holiday and travel business. In addition to your sound FORTRAN experience, a knowledge of Perkin Elmer equipment and some database would be an advantage. Analyst and design background. Initially you will be working within a small team and every opportunity for advancement will be available as the company expands. Your involvement will be required in developing applications software to include reservations and on-line transaction processing. Also your ability to liaise with users and suppliers will be fully utilized. **REF. MW/2833**

HEWLETT PACKARD - ONLY LANGUAGE To £10,500

You are currently an HP 4000 Programmer with over 18 months experience in any language. If you are a London-based client, a long-established client, even better would like to hear about you. They are currently developing new systems for both the HP 4000 and HP 250 in SP1, COBOL, BASIC and some RPG II. You will work in a small team using the latest on-line and database techniques. You can expect to progress quickly into analysis. Call now for further details. **REF. AW/2807**

For details of our RPG II opportunities please see opposite page.

URGENT CONTRACTS

VAX SYSTEMS MANAGER

VAX/FORTRAN/GRAPHICS

VAX/FORTRAN/TOTAL

VAX/FORTRAN

VAX/FORTRAN/RAPPORT

VAX/FMS/FORTRAN

VAX/COBOL/DATATRIEVE

VAX/FORTRAN/ARBAT

VAX/FORTRAN/INFO

WANG/COBOL

BASIS/DATABASE

HP3000 COBOL

INTEL 8066 PLM 86

ARTEMIS

PRIME EXPERT

IBM/FORTRAN/O.R.

TECHNICAL WRITER

DOS/COBOL CICS

IBM UFO

IBM SERIES 1/ASSEMBLER

IBM/ASSEMBLER

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SOON

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OCT

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SOON

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OCT/NOV

NOW

OCT/NOV

NOW

ANALYSTS & PROGRAMMERS

MVS TRAINING

CITY to £13,000 pa
Multi-national organisation based in the City is strengthening its technical side. This has necessitated the need to employ good DOS/VSE SYSTEMS PROGRAMMERS. Current hardware consists of IBM 4341's, upgrading soon to IBM 3083's, which will utilize the MVS operating system, thus creating a perfect opportunity for successful candidates to migrate to MVS. This is a fast growing department offering excellent staff benefits. Ref: S1282.

CICS TRAINING

CITY to £10,000
A City-based International Bank housing 2 x IBM 4341's under DOS/VSE, with CICS and DL/I, is currently recruiting a number of PROGRAMMERS, to join their MAJOR ONLINE COMMERCIAL LOANS TEAM. Programmers with around 2 years' experience of COBOL and preferable some exposure to CICS and/or DL/I, who would welcome further training in these areas should apply now. Company benefits and scope for career advancement are excellent. Ref: A1253.

ANALYST/PROGS

SW LONDON to £13,000 pa
This MANUFACTURING giant situated in South West London would like to recruit good IBM ANALYST/PROGRAMMERS, with at least 2 years programming in COBOL, and some ANALYSIS experience. They house IBM 4341 computers with CICS on-line and DL/I Database. The successful candidates will have the opportunity to become increasingly involved in SYSTEMS ANALYSIS, DESIGN and OPERATIONS, and those with the potential will progress into management. Ref: S1311.

PL1 PROGRAMMERS

CITY £8-12,000
One of the largest and most successful international Insurance Broking Groups based in the City are recruiting a number of PL1 programmers. Interesting on-line applications await you in a sophisticated environment consisting of an IBM 4341, Series 1 Micros and recently installed WANG VS equipment. Candidates with a good standard of education and between 2-5 years experience of PL1 programming, should apply now for an early interview. Ref: A1310.

CICS PROGRAMMERS

SURREY £10,000 + pa
Large International travel organisation have positions available for programmers with at least 2 years programming in COBOL on IBM hardware using CICS. Their computer is an IBM 4331, with a large on-line network of terminals, both remote and local. Wide range of interesting development work available covering various systems. Excellent salary and benefits on offer, generous WORLD-WIDE TRAVEL CONCESSIONS, free Life Assurance and subsidised staff restaurant. Ref: S1244.

SYSTEMS ANALYST

CITY to £13,500
This major organisation is looking for ANALYSTS to join their expanding project team concerned with developing ON-LINE ACCOUNTING SYSTEMS. Our client houses an IBM 3033 running under MVS, IMS DB/DC with communications links to a PRIME MINI. The successful applicants will have around four year's total experience, preferably gained in an IBM mainframe environment and ideally have had some exposure to minis. Opportunities for career progression are excellent. Ref: A1271.

Those are just some of the positions available, if your particular "expertise", or "ideal job" has not been advertised, then give SBS a call and discuss your career requirement with one of our recruitment team.

SBS RECRUITMENT
Scientific & Business Systems Limited
22 Bloomsbury Square London WC1A 2NS
Telephone: 01-6379541 (24 hr answering service)

CONTRACTS

IBM SYSTEM 34 RPG II ± COBOL ANALYST PROGS

LONDON

DEC DIBOL CTS 500 ANAL/PROG

KENT

IBM COBOL IMS DB/DC ANAL PROG

SURREY

IBM SYSTEM 38 RPG III ± MAAPICS ANAL/PROG

SUSSEX

For further details contact TIP POLE AND TIP

A division of Tate & Lyle Industries Ltd.
Leon House, High Street, Croydon CR9 3NH

A member of the Tate & Lyle PLC Group



DIBOL 36

Technical Support

Midlands/North West c £13K + Relocation

This is an excellent opportunity to join a major progressive organisation currently expanding its computer network. The successful candidate will join a small dynamic technical support team and will specialise in DPS 6 support, although there will be ample opportunity to work with a variety of other hardware/software.

Sound GCOS 6 experience is essential, ideally on a networked environment using T.P.S. In addition to good technical skills, candidates should have a broad appreciation of user needs in a complex environment.

Rewards include:

- High degree of job satisfaction
- Progressive salary based on merit
- Excellent career prospects
- First class conditions of employment
- Relocation package where appropriate

All replies will be treated in strict confidence.

For further details, please contact Barry Turton on (0270) 627206 weekdays, or Alwyer (0936) 4749 during evenings and weekends, or write to him at the address below.

OCC Computer Personnel
5 Hospital Street
NANTWICH
Cheshire
(0270) 627 206

5427

Ericsson Information Systems is the U.K. subsidiary of the world leading telecommunications manufacturer. Their goal is integrated information systems and office automation for which they already have all the essential components:

Knowledge in the area of telecommunications
Advanced ergonomically designed terminals
Expertise in decentralised mini computer systems
Custom-tailored computer systems
Data communications, data transmission and networking products

To ensure the Company's continued development at their current growth rate of 30% per annum, the following additional software appointments are now to be made:

Senior Systems Advisers

BIRMINGHAM AND LONDON

SALARY PACKAGE - £11K to £14K + Car or Car Allowance

The successful candidates will have a positive approach to both pre and post sales, together with at least 5 years computing experience. You will need to demonstrate experience of:

- | | |
|-------------------------------|----------------------|
| ■ Commercial/Business Systems | ■ Project Management |
| ■ Systems Analysis | ■ Telecommunications |
| ■ Mini Computers | ■ Sales Support |

Systems Advisers

BIRMINGHAM AND LONDON

SALARY PACKAGE - £9K to £11K + Car Allowance

To be offered these positions, you will need to have up to 5 years computing experience and will be able to demonstrate a working knowledge of the following:

- | | |
|-------------------------------|--------------------------------|
| ■ Commercial/Business Systems | ■ Mini Computers |
| ■ Systems Analysis | ■ COBOL programming experience |

Senior Programmer/Analysts

BIRMINGHAM AND LONDON

SALARY PACKAGE - £9K to £11K + Car Allowance

These roles will assume the principal technical responsibility within the Group. The following expertise is required:

- | |
|--|
| ■ A minimum of 2 years COBOL on mini computers |
| ■ Real time commercial applications experience |
| ■ Experience of structured programming |
| ■ Telecommunications |

Applications Programmers

BIRMINGHAM AND LONDON

SALARY PACKAGE - £7K to £9K + Car Allowance

The appointed candidates will work as part of the Customer Services Team with a high level of user contact in tailoring standard application packages and the provision of technical support. The required experience is:

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| ■ 12 months COBOL on mini computers |
| ■ Real time commercial applications experience |
| ■ Structured programming |

BUT ALL THIS IS NOT ENOUGH - WE NEED A DIALOGUE WITH YOU ON THE SHAPING OF THE SYSTEMS OF THE FUTURE. ERICSSON'S ARE READY WHEN YOU ARE AND THEY ARE WELL AHEAD OF THE FIELD.

For further information and a local interview in either Birmingham or London, please telephone the Advising Consultants on 061-236-1157 during office hours. Evenings and Weekends until 9.00 p.m. telephone Jeff Walton on 061-962-0002 or Roy Torres on 0422-823153.

OPPORTUNITIES AT CSP

Computer Systems & Products, the fast expanding Nottingham-based systems and software house has the following opportunities:

- PRE-SALES SUPPORT SYSTEMS ANALYST
Based in Nottingham DEC experience preferred Ref R.V. Gutteridge.
 - SENIOR FIELD SERVICE ENGINEER
Based in Winchester. DEC experience preferred. Ref: R.C. Goold
 - FIELD SERVICE ENGINEERS
London, Winchester and Nottingham areas. DEC experience preferred. Ref: R.C. Goold
- These positions represent worthwhile opportunities in a go-ahead company with excellent working conditions. A first class remuneration package is offered including BUPA, Life Assurance and usual fringe benefits. Write with full career details to date.
- CSP** Barrasford House, Goldsmith Street, Nottingham, NG1 5JY.
Tel: (0602) 415155.

MARCH NOEL ROAD, LONDON N1 BHQ

01-354 1055

INTERFACE

RECRUITMENT & SELECTION CONSULTANTS LTD

Manchester House, 86 Princess Street,
Manchester M1 6NG. Tel: 061-236 1157.

DALROTH

NETWORK MANAGEMENT SOFTWARE PROTOTYPE DEVELOPMENT PROJECT

Can you . . .

- ★ DESIGN & DELIVER WORKING SOFTWARE
- ★ CONTRIBUTE IN AN AREA OF EXCELLENCE
- ★ PLAY YOUR PART IN GROWING THE COMPANY
- ★ JUSTIFY A SALARY UP TO £15,000

Are you . . .

Capable of investigating methods of Network Management and Control; designing and developing a tool that will enable your team to deliver software for a new concept of Network Management.

You must . . .

Have a good degree and experience in the design and development of REAL TIME COMMUNICATIONS SYSTEMS.

Ideally you . . .

- Would have experience in any of the following:
- ★ PACKET SWITCHING
 - ★ LOCAL AREA NETWORKS
 - ★ MESSAGE SWITCHING
 - ★ GATEWAY EXCHANGES
 - ★ PRIME, PDP, VAX or TANDEM

The project . . .

Is based in The West on client premises, though later some development may be brought in-house (also in West).

The positions . . .

are for both:
TEAM LEADERS AND TEAM MEMBERS

The company . . .

Offer an ideal opportunity for enthusiastic and well qualified professionals to enhance both their own and the company's reputation at home and abroad.

For further information, please contact Jenny Dalrymple-Hay or Ian Murray West on 01-493 2947, from 8am to 10pm Monday to Friday or weekends Ian Murray West on Milton Keynes (0908) 563415 quoting Ref. 6002.

DALROTH & PARTNERS LTD, 4 HALF MOON STREET, LONDON W1 TEL: 01-493 2947

NORTH WEST

IBM COBOL CICS DL/1 ANALYST/PROGRAMMERS BENEFITS PACKAGE SOFTWARE AND CONSULTANCY SERVICES £10-14K PLUS CAR

As part of our planned expansion in 1983/84 an outstanding opportunity exists for Analyst/Programmers with good COBOL CICS and DL/1 experience to join our Northern Regional Systems Team.

P-E Computer Services is a leading international software house and consultancy. Since 1969 we have provided a comprehensive service in the areas of consultancy, training services, systems development and support.

Company benefits include an attractive salary, company car, generous expense allowances, non-contributory pension scheme plus the security of working for a long-established, well-managed professional organisation.

If you feel you could respond to the challenge of working in this dynamic environment you are invited to take your career a step further by telephoning or writing to Peter Moore, Regional Manager, at the address below.

P-E Computer Services Limited

Winchester House, Fountain Street, Manchester M2 2EF. Tel: 061-228 2778

(5227)

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CONSULTANCIES
(01) 661 8787

DIRECT ADVERTISERS
(01) 661 8080

Text 100 is a young, rapidly-expanding PR consultancy with a client list that includes a number of the most interesting companies in the UK microcomputer industry.

Text 100 currently requires a further technical writer with a general understanding of microcomputers to train in all aspects of press and public relations.

Interested? You'll need to be between 23 and 30 years of age, and have a lively and creative writing

style and a genuine interest in microcomputers.

More importantly still, you will need a forceful, outgoing personality and the willpower to succeed against some of the youngest and most professional people in the industry. As you would expect, this is a standing career opportunity, carries a very attractive salary,

(according to your experience), possible plus car. Still interested?

Reply with full CV to:

Tom Lewis
Managing Director
Text 100 Ltd
10 Barley Mow Passage London W1 4PH

COMPUTER PERSONNEL SAUDI ARABIA

The following grades are required to work through an associate company in Saudi Arabia. Candidates should be well educated and our minimum age requirement is 22 years.

SYSTEMS ANALYSTS £25,000 TAX FREE

Must have extensive PL/I and Fortran linked with IBM environment. TSO MVS VM SAS and SPF knowledge essential. Good communication skills and documentation writing, as well as some training experience advantageous.

SUPERVISORS - TP SERVICES/ TP EQUIPMENT ANALYSTS £25,000 TAX FREE

Experience with large IBM Systems and MVS/JES 2, S/370, VTAM, graphics and output on to Calcomp and Benson plotters as well as 3800 series printers.

We offer bachelor status contracts annually renewable, accommodation and transport, paid leave to UK and medical insurance.

Please telephone and request an application form for further details.

SURVEY & DEVELOPMENT SERVICES
1 Atholl Place, Edinburgh. Tel: 031-228 1446

City of Salford

DATA PROCESSING

COMPUTING CONTROL ASSISTANT

(Scale 8/8021 £8,164-10,629)

COMPUTER CENTRE - SWINTON

Post Ref: 2013/CW

The Computing Control Section assists the Computer Operations Department by the design and specification of computer operations procedures based on new and revised applications running on the City Council's computers which the principal machine is, at present, an ICL 2966 running under VME.

Major development of new applications, based on IDMS and TRIM, is also underway. Existing work embraces ICL 1900 batch and 2900 batch, TPS & MAC.

The responsibilities include data security, scheduling work, recording and monitoring machine use, media selection and the provision of an efficient computing service to City Council departments from an efficient network of computers, operating software and computer-based equipment.

The successful applicant will possess practical experience and knowledge of the operational aspects of the provision of a computing service.

Starting salary will depend on qualifications and experience.

Application forms may be obtained from the Personnel Manager, Civic Centre, Swinton, Manchester M27 2BN. Telephone 061-794 0000. Please quote the appropriate post reference in all communications. Date for applications: October 7, 1983.

To develop interactive systems on our IBM System 38.

We require a minimum of 6 months' GSD

experience, combined with

analyst/programming experience, using

RPG II/III.

In addition, a knowledge of COBOL and

BASIC would be an advantage. Good

communicative skills are essential to liaise

between user and development staff.

As a successful and progressive company

we can offer competitive salaries together

with attractive employment conditions

and relocation where appropriate.

Interested? Think you can handle the

challenge? Then write or telephone for an

application form to:

The Personnel Department, Palitoy Company, Owen Street, Coalville, Leicestershire. Tel: Coalville 36388.

(5483)

Palitoy

Join our action force

We're Palitoy, the UK's leading toy manufacturers, makers of such famous names as Star Wars, Action Man - and Action Force, of course. Our own Action Force of dedicated DP professionals is expanding to cope with a major development programme on interactive systems based on IBM 38 - and we're currently looking for additional troops (male or female) to join us.

Operations Manager

We now require an Operations Manager, with proven managerial ability to lead a team of 12. Educated to 'A' level standard preferably with a working knowledge of IBM System 34/38.

O and M Analyst

To analyse and appraise our existing systems to ensure that users are adequately trained and that procedures are followed. In addition, the person appointed will assist in the design of new interactive systems and be responsible for ensuring all documentation is accurately maintained during this period of intensive systems development.

A background in DP work and considerable O and M experience as applied to computer systems is essential.

Product Development Specialists

£12-16,000 p.a.

U.S.A. Training Our client is a world leader in data communications, using innovative technology to produce sophisticated, high quality networking products and systems. Following commitment from their USA parent to large-scale expansion in the UK and Europe, they are currently forming a new design group who will conduct a variety of development projects specifically for the European market.

Of primary interest in this inaugural phase are design engineers, with experience in relevant areas, including communications software and hardware, operating systems and terminals.

In addition to the outstanding prospects related to their extensive growth, the company offers an excellent salary and benefits package. Initial product experience will be gained at their Florida-based facility for a period of approximately six months.

For further details of this exciting opportunity, please telephone Ken Allwright on (0628) 74274 or write to him at Charvil Lewis International, 27 Marlow Road, Maidenhead, Berkshire.

Charvil Lewis
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URGENT CONTRACTS

ANALYSTS OR PROGRAMMERS
WITH TECHNICAL/SCIENTIFIC EXP.
ON ASSEMBLER, CORAL 66 OR PASCAL
Call Wendy at KPG on 01-948 5922
or 01-907 1787 Evenings

KPG
Computer Support
Services Limited
Cobden House, Park Lane
Richmond, Surrey TW9 2RA

Micro & Mini Package Development

Analyst/Programmer RPG II/III

c £12,500 + Car

We have been retained by a computer company which is part of a large transport group.

This company is developing a fully integrated computer package which services haulage companies throughout the United Kingdom. It has been developed on micros and there are now plans to convert this system on to minis.

This is an excellent opportunity to join this young company and develop with it as it grows. It is anticipated that a move into management will follow shortly.

The skills required are strong micro knowledge from both the technical and user aspects (Sirius, Apple etc), knowledge of transport operations particularly desirable but not essential. Working with minimal supervision, you will need to be a self-starter, possessing the skills to get things done quickly and efficiently. Technical support will be an important part of the position which could involve UK travel from time to time. A flexible attitude to work is essential.

For additional details please phone Sue Ashby on 0784 59247 or at home on 0844 53531 (evenings & weekends).

Ferguson Thorley Bowles
Associates Limited
International Personnel Consultants
15 Clarence Street, Slaines, Middlesex TW18 4SU
Telephone: Slaines (0784) 59247 Telex: 881448

PUBLIC SECTOR APPOINTMENTS

CAN YOU
DO OUR
BUSINESS ?

LONDON
S.W.17

The South West Thames Regional Health Authority requires additional staff within COMPUTER OPERATIONS. To be based at their regional computer centre located at Springfield Hospital, Tooting, London S.W.17.

Computing Services are based upon ICL 2966 and 2956 MAINFRAMES running under GEORGE 3/DME which provide financial, medical and managerial information to the region.

DEC VAX MINI-COMPUTER are currently being installed to provide On-line patient administration.

Direct Data Capture and Database facilities to hospitals within the region.

A two-shift system is in operation, and where* indicated the quoted salaries include London Weighting and shift allowance. Additional benefits include excellent recreational facilities (both on-site and nearby), coffee lounge and modern offices.

OPERATIONS CONTROLLER

£11,237-£14,029*

An operations professional is required for this post. Reporting directly to the Operations Manager the successful candidate will be responsible for the shift management of up to 40 personnel and the co-operation of all activities within operations, including Data Control and Data Preparation.

Applicants must possess proven managerial ability with good communicative skills, both verbal and written. An in-depth knowledge of ICL 2900 hardware is essential.

COMPUTER OPERATOR

£6,820-£8,000*

An experienced George III operator is required to fill this vacancy. Experience of working in a busy medium/large installation would be an advantage, although this is not essential.

OPERATIONS SUPPORT CLERK

£6,667-£9,151

Previous experience in operations is required for this new post to assist the Operations Support and Liaison Officer.

Candidates must possess an in-depth knowledge of ICL utilities and job control language. An ability to communicate clearly and effectively is essential.

DATA CONTROL CLERK

£6,820-£8,000*

A vacancy exists for an experienced Data Control Clerk with a good knowledge of GEORGE 3 JCL and a sound understanding of data control standards and procedures. Suitable trainees will be considered.

DATA PREPARATION SECTION LEADER £5,683-£6,667

An experienced person is required to lead a team of up to 10 Punch Operators. Previous supervisory experience is essential, and a knowledge of CMC 5200 equipment would be an advantage.

DATA PREPARATION PUNCH OPERATORS

£4,871-£5,443

Vacancies exist for Punch Operators with good key depression speeds. (10,000+). Experience of CMC equipment would be an advantage. A bonus scheme is in operation.

For further details contact:
Norman McGregor, SWTRHA, Regional Computer Centre, Springfield Hospital, 61 Glenburnie Road, London S.W.17. Tel: 01-872 8988



**THE POLYTECHNIC
WOLVERHAMPTON**

LECTURING POST

Lecturer II/Senior Lecturer in Computing

Preference will be given to well-qualified candidates with research or development experience in computer graphics, artificial intelligence and knowledge of computing.

Salary: £7,215-£13,443 p.a.

Details and application forms returned by October 10, 1983, from Establishment Clerk, The Polytechnic, Wolverhampton WV1 1SB, or telephone Wolverhampton (092) 710654 (ansaphone).

GREAT GRIMSBY BOROUGH COUNCIL

MANAGER

Information Technology Centre

£9,948-£11,092

Applications from registered disabled persons will be welcome.

An Information Technology Centre is to be established in Great Grimsby with the aim of helping the unemployed young people gain work experience and training in the area of new technology. Thirty young people and five adult staff will be involved in such fields as basic electronics; basic computer skills; word processing and the electronic office. We are seeking a person with proven managerial experience, a capacity for both hardware and software, and knowledge of production and working techniques to help set up and then to manage the day-to-day operation of the centre.

An outline job description and application form are available from the Personnel Officer, Great Grimsby Borough Council, Municipal Offices, Town Hall Square, Great Grimsby DN31 1HU, telephone number 0472 56181. Completed forms must be returned by 14th October, 1983.

WEST SOMERSET DISTRICT COUNCIL

APPOINTMENT OF COMPUTER OPERATOR

SCALE 3/4 (£6,640-£7,005)

Applications are invited from suitably qualified persons for the above position in the Treasury's Department at Minehead. Applicants should have extensive knowledge of ICL operating systems and utilities (preferably TME and CLI) and be able to maintain reciprocal cover with Data Prep Supervisor (using DDE).

The commanding salary will be determined according to the ability and experience of the successful applicant. Five-day week, 20 working days/year annual leave, plus superannuation. Assistance with housing accommodation if approved cases.

Application forms may be obtained from the Treasurer at the Council Offices, 37 Blenheim Road, Minehead, to whom all applications should be submitted by October 5, 1983.

H. CLOSE

Chief Executive Officer and Clerk

Council Offices, 20 Fore Street, Williton, Taunton TA4 4QA, Somerset



FARNBOROUGH COLLEGE OF TECHNOLOGY

LECTURER GRADE I IN COMPUTING

To teach in a range of courses up to HND level.

TEMPORARY LECTURER GRADE I IN COMPUTING/ DATA PROCESSING

In a similar range of courses. Appointment to 31/8/84 in first instance.

Applicants should have good industrial/commercial experience and acceptable qualifications. Salary range £3,640 to £3,735 p.a., starting point depending on experience and qualifications.

Further particulars from the staffing officer, Farnborough College of Technology, Boundary Road, Farnborough, Hants GU14 6BB (S.A.E. please).

Closing date: 7th October, 1983.

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